

BERMUDA GAMING COMMISSION (BGC)



BGC-1 CASINO GAMING MACHINE STANDARDS

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Table of Contents

| | |
|---|-----------|
| CHAPTER 1: INTRODUCTION TO GAMING DEVICES | 5 |
| 1.1 Introduction..... | 5 |
| 1.2 Purpose of the Equipment Standard..... | 6 |
| 1.3. Definition of a Gaming Machine | 7 |
| CHAPTER 2: GAMING MACHINE / TERMINAL REQUIREMENTS | 8 |
| 2.1 Introduction..... | 8 |
| 2.2 Machine and Patron Safety | 9 |
| 2.3 Environmental Effects on Terminal and Gaming Machine Integrity | 10 |
| 2.4 Basic Hardware Requirements..... | 12 |
| 2.5 Custom or Modified Hardware Requirements..... | 14 |
| 2.9 Machine Critical NV Memory | 24 |
| 2.10 Machine Logs | 27 |
| 2.11 Electronic Accounting and Occurrence Meters..... | 30 |
| 2.12 Game Display Devices | 35 |
| 2.13 Patron Interaction Devices | 37 |
| 2.14 Machine Communications Protocol | 38 |
| 2.15 Machine Connections to the Internet..... | 40 |
| 2.16 Multi-Patron Machine..... | 41 |
| CHAPTER 3: PERIPHERALS AND PAYMENTS..... | 43 |
| 3.1 Introduction..... | 43 |
| 3.2 Wagering Instruments | 43 |
| 3.3 Bill Validators and Stackers..... | 46 |
| 3.4 Patron Identification Components | 51 |
| 3.5 Payment and Payment Devices | 52 |

BCGC-1 Gaming Machine Standards

| | |
|---|-----------|
| CHAPTER 4: RANDOM NUMBER GENERATOR (RNG) REQUIREMENTS | 55 |
| 4.1 Introduction..... | 55 |
| 4.2 General Random Number Generator (RNG) Requirements..... | 56 |
| 4.3 Random Number Generator (RNG) Strength and Monitoring..... | 59 |
| 4.4 Mechanical Random Number Generator (RNG) (Physical Randomness Device)61 | |
| CHAPTER 5: GAME REQUIREMENTS | 63 |
| 5.1 Introduction..... | 63 |
| 5.2 Patron Interface..... | 64 |
| 5.3 General Game Requirements..... | 66 |
| 5.4 Game Information and Rules of Play..... | 69 |
| 5.5 Game Outcome Using a Random Number Generator (RNG) | 79 |
| 5.6 Game Fairness..... | 81 |
| 5.7 Game Payout Percentages, Odds, and Non-Cash Awards | 84 |
| 5.8 Bonus/Feature Games | 86 |
| 5.9 External Device Bonus Games..... | 88 |
| 5.10 Double-Up / Gamble Features..... | 90 |
| 5.11 Residual Credit Removal Feature..... | 91 |
| 5.12 Mystery Awards..... | 92 |
| 5.13 Multiple Games on the Gaming machine..... | 93 |
| 5.14 Game Program Interruption and Resumption..... | 95 |
| 5.15 Taxation Reporting Limits for Games | 96 |
| 5.16 Alternative Game Modes | 97 |
| 5.17 Game History Recall..... | 100 |
| 5.18 Tournament Games..... | 102 |
| 5.19 Games with Skill..... | 106 |
| 5.20 Persistence Games | 110 |

BCGC-1 Gaming Machine Standards

| | | |
|------------------------------------|---|------------|
| 5.21 | Community Bonus Games..... | 112 |
| 5.22 | Progressive Jackpots and Incrementing Jackpots..... | 115 |
| 5.23 | Virtual Event Wagering..... | 120 |
| GLOSSARY OF KEY TERMS | | 124 |

CHAPTER 1: INTRODUCTION TO GAMING DEVICES

1.1 Introduction

1.1.1 General Statement.

Pursuant to section 199 of the Gaming Act 2014 (“the Act”), this equipment standard prescribes criteria to be met for gaming machines.

The criteria are not exhaustive. All statutory requirements contained in the Gaming Act 2014 (“the Act”) and the Gaming (Casino) Regulations 2018 (“the Regulations”) shall be observed. This standard expressly applies for the purposes of the Regulations and section 93 of the Act. Approval shall be valid for a maximum term of 10 years and all applicable legislation and standards must be met on an ongoing basis.

These standards are of general application and seek to take account of the wide diversity of institutions which may be licensed under the Act. There may be need for revision of the standard from time to time. Material changes in the standards will be published generally by issuing a revised standard.

1.2 Purpose of the Equipment Standard

1.2.1 Purpose.

The purpose of this equipment standard is as follows:

- a) To eliminate subjective criteria in analyzing and certifying gaming equipment operation.
- b) To primarily test those criteria that impact the credibility and integrity of gaming equipment from both the revenue collection and patron's perspective.
- c) To create a standard that will ensure that gaming equipment is fair, secure, and able to be audited and operated correctly.
- d) To recognize that non-gaming testing (such as electrical testing) should not be incorporated into this standard but left to appropriate laboratories that specialize in that type of testing. Except where specifically identified in this standard, testing is not directed at health or safety matters.
- e) To construct a standard that can be easily revised to allow for new technology.
- f) To construct a standard that does not specify any particular design, method, or algorithm. The intent is to allow a wide range of methods to be used to conform to the standard, while at the same time, to encourage new methods to be developed.

1.2.2 No Limitation of Technology.

This document must not be read in such a way that limits the use of future technology. The Commission may review this standard and may make revisions as necessary to incorporate standards for new and related technology.

1.3. Definition of a Gaming Machine

1.3.1 General Statement.

A gaming machine refers to any device, whether wholly or partly mechanically or electronically operated, that is so designed that it may be used for the purpose of playing a game of chance or a game of mixed chance and skill, and as a result of making a wager on the device, winnings may become payable. At a minimum, a gaming machine utilizes an element of chance and/or skill in the determination of prizes, contains some form of activation to initiate the wagering process, and makes use of a suitable methodology for delivery of the determined outcome. The functions of a gaming machine may be logically separated into multiple parts or distributed among several physical and/or server components. The terms “gaming machine” and “machine” are used interchangeably throughout this document.

CHAPTER 2: GAMING MACHINE / TERMINAL REQUIREMENTS

2.1 Introduction

2.1.1 General Statement.

This chapter sets forth the technical requirements for the key attributes of a gaming machine or terminal. All proprietary devices developed for gaming machines shall meet the applicable requirements within this chapter. Unless otherwise directed by the Commission, this chapter may not apply to gaming machines that solely utilize unaltered commercial off-the-shelf (COTS) components, such as PCs or tablets. For gaming machines that utilize modified off-the-shelf (MOTS) components, sections of this chapter may apply only to the modifications made to the components unless otherwise directed by the Commission.

2.2 Machine and Patron Safety

2.2.1 Physical Hazards and Environmental and Electrical Safety Testing.

Testing of electrical and mechanical parts and design principals of the gaming machine such as Electro-Magnetic Compatibility (EMC) or Radio Frequency Interference (RFI) (product safety or other compliance testing) is to be conducted by an approved vendor.

NOTE: The UL or equivalent certification must be provided for review prior to approval.

2.3 Environmental Effects on Terminal and Gaming Machine Integrity

2.3.1 General Statement.

This section on integrity is only applicable for a gaming machine which has locally stored critical Non-Volatile (NV) memory and/or installed software which has the potential to influence the integrity of a gaming machine.

2.3.2 Gaming Machine Integrity.

The testing laboratory shall perform certain tests to determine whether or not an Electro-Static Discharge (ESD) or a power surge impacts the integrity of a gaming machine. ESD testing and power surge testing are intended to simulate techniques observed in the field that may be used in an attempt to disrupt the integrity of gaming machines.

2.3.3 ESD Effects.

A gaming machine shall comply with the following requirements related to ESD testing:

- a) The Random Number Generator (RNG) and random selection process shall be impervious to influences from ESD; and
- b) Protection against ESD requires that the gaming machine's conductive cabinet be earthed in such a way that static discharge energy shall not permanently damage or permanently impact the normal operation of the electronics or other components within the gaming machine. Gaming machines may exhibit temporary disruption when subjected to a significant external ESD with a severity level of 27kV air discharge. The gaming machine shall exhibit a capacity to recover and complete any interrupted play without loss or corruption of any locally stored control information or critical data following any temporary disruption.

2.3.4 Power Surges.

The gaming machine shall not be adversely affected, other than resets, by surges or dips of $\pm 20\%$ of the supply voltage. It is acceptable for the gaming machine to reset provided no damage to the equipment or loss or corruption of locally stored data is experienced. Upon reset, the game must return to its previous state. It is acceptable for the game to return to a game completion state provided the game history and all credit and accounting meters reflect a completed game. Alternatively, the gaming machine may be equipped with an Uninterruptible Power Supply (UPS) or battery backup that, when detecting power loss, allows the completion of the current game before ceasing operations.

2.3.5 Circuit Protection.

The power supply used in a gaming machine must be appropriately fused or protected by circuit breakers. The amperage rating of all fuses and circuit breakers must be clearly stated on or near the fuse or the breaker.

2.4 Basic Hardware Requirements

2.4.1 Serial Number.

In accordance with Regulation 30(2), a gaming machine shall have a serial number affixed permanently in lettering no smaller than five millimetres on the metal frame or other permanent component of the machine and on a removable metal plate attached to the cabinet of the machine

2.4.2 Identification Information.

The gaming machine shall be identifiable by model number, manufacturer identification, and any other information required by the Commission.

2.4.3 Gaming Machine Control.

A gaming machine shall be controlled by one (1) or more microprocessors or the equivalent in such a manner that the game program is completely controlled by the microprocessor(s). This does not preclude a game outcome from being derived from a mechanical device as described under the “Random Number Generator (RNG) Requirements” chapter of this standard.

2.4.4 Tower Light.

The gaming machine shall have a light located prominently on its top that automatically illuminates when a patron has won an amount or is collecting credits that the device cannot automatically pay, an error condition has occurred, or a ‘Call Casino employee’ request has been initiated by the patron. For bar-top style devices, it is permissible for the tower light to be shared among a group of gaming machines, or to be substituted by an audible alarm.

NOTE: The testing laboratory will make no determination as to tower light color or flash sequence. Furthermore, alternative means such as displayed messages, audible tones,

special animation effects, game-to-system communications etc., that may be used to alert appropriate personnel will be considered on a case-by-case basis and discussed with the Commission to determine acceptance.

2.4.5 On/Off Switch.

An on/off switch that controls the electrical current supplied to the machine shall be located in a place which is readily accessible within the interior of the gaming machine. The on/off positions of the switch shall be clearly labeled.

2.5 Custom or Modified Hardware Requirements

2.5.1 General Statement.

This section only applies to custom and modified hardware components which have the potential to influence the integrity of a gaming machine.

2.5.2 Printed Circuit Board (PCB) Identification Requirements.

Each PCB shall be clearly identifiable by an alphanumeric identification and, when applicable, a revision number. If track cuts, patch wires, or other circuit alterations are introduced to the PCB, then a new revision number shall be assigned.

2.5.3 Switches and Jumpers.

If the gaming machine contains switches and/or jumpers, the following rules shall be met:

- a) All hardware switches or jumpers shall be fully documented for evaluation by the testing laboratory; and
- b) Hardware switches and/or jumpers which may alter the jurisdiction-specific configuration settings, paytables, game denomination, or payout percentages shall meet the applicable sections of this document and must be housed within the logic compartment of the gaming machine. This includes award changes (with or without progressives), selectable settings, or any other option that would affect the payout percentage.

2.5.4 Machine Wiring.

The gaming machine shall be designed so that power and data cables into and out of the device can be routed so that they are not accessible to the general public. Wires and cables that are routed into a logic area shall be securely fastened within the interior of the device using appropriate mechanical fasteners, plugs, sockets, connectors, etc.

NOTE: The testing laboratory will make no determination as to whether the gaming machine installation conforms to local electrical codes, or to any other electrical testing standards, and practices. The UL or equivalent certification must be provided for review prior to approval.

2.5.5 Charging Mechanisms.

A gaming machine may support the use of an externally accessible charging mechanism, such as a Universal Serial Bus (USB) charging port, or some other analogous technology (e.g., cables, inductive chargers, etc.). The mechanism may be used to provide external power or charging access for an electronic device such as a smartphone, tablet, etc. If so equipped, the charging mechanism shall:

- a) Be appropriately fused and/or electrically-protected; and
- b) Not impact the integrity, proper operation, or outcome of the gaming machine.

NOTE: Please reference section entitled “Touch Screen Displays” for requirements applicable to display devices that support touch screen functionality.

2.5.6 Wired Communication Ports.

Wired communication ports shall be clearly labeled and must be securely housed within the gaming machine to prevent unauthorized access to the ports or their associated cable connectors.

2.6 Terminal Doors

2.6.1 Physical Security.

A gaming machine shall be robust enough to resist forced entry into any secured doors, areas, or compartments. In the event that extreme force is applied to the cabinet materials causing a potential breach in machine security, evidence of tampering must be conspicuous. "Secured areas" or "secured compartments" shall include the logic area(s), external doors such as the main door or belly door, cash compartment doors such as a drop box door, peripheral device access area(s), and/or other sensitive access areas of the gaming machine that can potentially impact game integrity such as top boxes, controllers, etc.

2.6.2 External Doors.

The following requirements apply to the gaming machine's external doors (e.g., main, belly, top box, etc.):

- a) External doors shall be manufactured of materials that are suitable for allowing only legitimate access to the inside of the gaming machine cabinet. Doors and their associated hinges shall be capable of withstanding determined and unauthorized efforts to gain access to the interior of the gaming machine and shall leave conspicuous evidence of tampering if such an attempt is made;
- b) The seal between the gaming machine cabinet and the door of a locked area shall be designed to resist the entry of objects. It shall not be possible to insert an object into the gaming machine that disables a door open sensor when the gaming machine's door is fully closed, without leaving conspicuous evidence of tampering; and
- c) All external doors shall be secure and support the installation of locks.

2.6.3 Door Monitoring.

All doors that provide access to secure areas of the gaming machine shall be monitored by a door access detection system. The detection system shall register a door as being

open when the door is moved from its fully closed and locked position, provided power is supplied to the gaming machine. The door access detection system shall monitor access to the following areas:

- a) All machine external doors that provide access to a secure area of the gaming machine;
- b) Logic door(s);
- c) Stacker door; the stacker door is the door immediately prior to accessing the stacker assembly;
- d) Any other bill or wagering instrument storage areas that have a door; and
- e) Peripheral device access areas.

2.6.4 Door Open/Close Interruptions.

When any one of the above-listed doors are opened, the gaming machine shall cease play, enter an error condition, display an appropriate error message, disable credit acceptance, and activate the device alert mechanism. This error condition shall be communicated to the electronic monitoring system when such a compatible system and protocol is supported. When all of the monitored doors are closed, the gaming machine shall return to its original state and display an appropriate door close event message, until the next game has started.

2.7 Machine Logic Area

2.7.1 General Statement.

The logic area is a separately locked area of the gaming machine which houses electronic components that have the potential to influence the outcome or integrity of the device. There may be more than one (1) such logic area in a gaming machine.

2.7.2 Electronic Components.

Electronic components that are required to be housed in one (1) or more logic areas shall include:

- a) A Central Processing Unit (CPU) or machine microprocessor(s);
- b) Any Program Storage Device (PSD) that contains software that may affect the integrity of gaming, including, but not limited to, game accounting, systems communication, execution of game play, game display, game result determination, security, etc.;
- c) Any electronics associated with the control logic for door monitoring and/or access detection;
- d) Any components that handle control programme signature computation or verification;
- e) Any components that manage encryption/decryption of critical data;
- f) Any communication controller electronics, and/or components housing the PSD responsible for communications; and
- g) Machine critical NV memory backup devices.

NOTE: Any exceptions to the above logic area requirements and components will be evaluated on a case-by-case basis.

2.7.3 Logic Area Access.

Logic area(s) shall contain an access detection mechanism to detect a logic door open condition, as defined elsewhere in this standard under the sections entitled “Door Monitoring” and “Door Open/Close Interruptions”.

2.8 Control Programme Software

2.8.1 General Statement.

This section sets forth the requirements for the control programme software which refers to the software that affects the result of a wager by determining win or loss.

- a) Control programme software includes any software, source language or executable code associated with
 - i. A random number generation process;
 - ii. The mapping of random numbers to game elements to determine game outcome;
 - iii. The evaluation of randomly selected game elements to determine win or loss;
 - iv. Payment of winning wagers;
 - v. Game recall;
 - vi. Game accounting includes the communication of meter and log information to a metering host system;
 - vii. Monetary transactions conducted through an electronic monitoring system;
 - viii. Software verification and authentication functions that are specifically designed and intended for use in a gaming machine;
 - ix. Monitoring and generation of game tilts or error conditions; and
 - x. Game operating systems that are specifically designed and intended for use in a gaming machine;
- b) Control programme software does not include software associated with the graphics, sound, animation or other such artistic attributes of a game that is used to provide entertainment that is not material to the game; and
- c) Control programme software, based on design, is downloaded to, or installed on the gaming machine's local PSD, run from a client server system, or a combination of the two.

NOTE: The term Program Storage Device (PSD) is defined to be the physical storage media or electronic device that contains control programme software. Types of PSDs

include, but are not limited to, EPROMs, Compact Flash and CFast cards, optical disks, hard drives, solid state drives, and USB drives. For the purpose of this equipment standard, logical partitions defined on a disk drive shall be viewed as separate PSDs. This partial list of PSD types may change as storage technology evolves.

2.8.2 Software Identification.

Control programme software shall contain sufficient information to identify the software revision level. If not clearly labeled on the PSD, it is acceptable for the gaming machine to alternatively display this information via a casino employee menu. In either case, each PSD shall be uniquely identified by the following information:

- a) Manufacturer identification, as appropriate;
- b) Program ID number;
- c) Version number, if applicable; and
- d) Location of installation in the gaming machine, if there are multiple locations possible and as applicable.

2.8.3 Software Validation.

It shall be possible to authenticate that all control programme software is valid each time the software is loaded for use prior to being available for any game play, and where supported by the electronic monitoring system, on demand as required by the Commission. In addition, for control programme software residing in one or more PSDs the following requirements shall apply to this authentication mechanism used to verify control programmes and data:

- a) For control programme software residing in EPROM(s), the authentication mechanism shall employ, at a minimum, a checksum; however, it is recommended that a Cyclic Redundancy Check (CRC) be used that is at least 16-bit.
- b) For control programme software residing in non-EPROM PSD(s), the authentication mechanism shall employ a hash algorithm which produces a message digest of at least 128 bits. Other test methodologies shall be reviewed on a case-by-case basis.

In addition, for alterable media the authentication mechanism shall also test

- i. Accessible areas of the alterable media for unintended programs or data and
 - ii. The structure of the media for integrity.
- c) In the event of a failed authentication (i.e., program mismatch or authentication failure or if unexpected data or structural inconsistencies are found), the gaming machine shall cease gaming operations (game play and credit acceptance/redemption), display an appropriate error message, and activate the device alert mechanism. This error condition shall be communicated to the electronic monitoring system when such a compatible system and protocol is supported. Additionally, the error condition shall require operator intervention to clear, and shall not clear until the control programme software authenticates properly following the operator intervention, or the software is replaced or repaired. Any control programme software that fails authentication shall not be loaded into gaming machine NV memory.

NOTE: Control programme verification mechanisms will be evaluated on a case-by-case basis and may be approved by the Commission and the testing laboratory after taking industry best practices into consideration.

2.8.4 Independent PSD Verification.

The gaming machine shall have the ability to allow for an independent integrity check of the device's PSD from an outside source. This verification is required for all PSDs containing control programmes that affect the integrity or outcome of the game. The verification shall be accomplished by being authenticated by a third-party application which may be embedded within the game software, by having an interface port for a third-party device to authenticate the media, or by allowing for removal of the media such that it can be verified external to the gaming machine. The integrity check must support a means for field verification of the software. The testing laboratory, prior to device approval, shall evaluate the integrity check method.

2.8.5 Independent Software Verification.

It shall be possible to perform an independent integrity check of the control programme software from an outside source. This verification is required for all control programmes

that affect the integrity of the gaming machine. The verification shall be accomplished by being authenticated by a third-party application run from the gaming machine and/or electronic monitoring system, by allowing a third-party device to authenticate the media, or by allowing for removal of the media such that it can be verified externally. A laboratory, prior to software approval, shall evaluate the integrity check method.

2.9 Machine Critical NV Memory

2.9.1 Contents of NV Memory.

Critical Non-Volatile (NV) memory shall be used to store all data elements that are considered vital to the continued operation of the gaming machine. Critical NV memory may be maintained by the Gaming Machine and/or a Client Server System. These data elements include, but are not limited to:

- a) All electronic meters defined in the “Electronic Accounting and Occurrence Meters” section of this standard;
- b) Current credits;
- c) Machine configuration data (e.g., button panel, top box, communications, progressive jackpots, incrementing jackpots, etc.);
- d) Game configuration data (e.g., payable, denomination, etc.);
- e) Game history/recall data;
- f) Machine state (e.g., machine error conditions, etc.);
- g) Game state (e.g., current game play status, progress, etc.); and
- h) All machine logs as defined within this equipment standard and as applicable based upon supplier implementation (includes “Bill Validator Recall”, “Wagering Instrument Out”, “Identifier”, “Machine Non-Wager Purchase”, and “Machine Significant Event” logs).

2.9.2 Critical NV Memory Requirements.

The following are the critical NV memory requirements for gaming machines:

- a) The gaming machine shall have the ability to retain data for all critical NV memory as defined herein and shall be capable of maintaining the accuracy of all information required for thirty (30) days after power is disconnected from the gaming machine;

- b) For rechargeable battery types only, if the battery back-up is used as an 'off chip' battery source, it shall re-charge itself within twenty-four (24) hours. The shelf life shall be at least five (5) years;
- c) NV memory that uses an off-chip back-up power source to retain its contents when the main power is switched off shall have a detection system which provides a method for software to interpret and act upon a low battery condition before the battery reaches a level where it is no longer capable of maintaining the memory in question. If a low battery condition is identified, the gaming machine shall display an appropriate error message and activate the device alert mechanism. This error condition shall be communicated to the electronic monitoring system, when such a compatible system and protocol is supported; and
- d) Clearing NV memory shall require access to the locked logic area or other secure method, provided that the method has been approved by, or can be controlled by the Commission.

2.9.3 Function of Critical NV Memory Reset.

Following the initiation of a critical NV memory reset procedure utilizing a certified NV memory clear method, the control programme shall execute a routine which initializes critical NV memory to the default state. All memory locations as per the NV memory clear process shall be fully reset in all cases.

2.9.4 Configuration Settings.

It shall not be possible to change a configuration setting that causes any obstruction or alteration to the electronic accounting meters without performing an NV memory clear. Any change to the available denominations or payable configurations shall be performed by a secure means which includes access to the locked logic area, or other secure method inaccessible to a patron.

2.9.5 Critical NV Memory Errors.

Critical NV memory storage shall be maintained by a methodology that enables errors to be identified. This methodology may involve signatures, checksums, redundant copies, database error checks, and/or other method(s) approved by the Commission.

2.9.6 Critical NV Memory Checks.

Comprehensive checks of critical NV memory data elements shall be made following game initiation, but prior to display of game outcome to the patron. NV memory that is not critical to gaming machine integrity is not required to be checked.

2.9.7 Unrecoverable Corruption of Critical NV Memory.

An unrecoverable corruption of critical NV memory shall result in an error and the gaming machine shall immediately cease play and tilt, display an appropriate error message, disable credit acceptance, and activate the device alert mechanism. The memory error shall not be cleared automatically. Additionally, the critical NV memory error shall cause any communication external to the gaming machine to cease. An unrecoverable critical NV memory error shall require a full NV memory clear performed by an authorized person.

NOTE: This section is not intended to preclude the use of alternate storage media types, such as hard disk drives, for the retention of critical data. Such alternate storage media is still expected to maintain critical data integrity in a manner consistent with the requirements in this section, as applicable to the specific storage technology implemented.

2.10 Machine Logs

2.10.1 Significant Event Log.

The last 100 significant events for gaming machines shall be stored with an appropriate timestamp in one (1) or more secure machine logs that are not accessible to the patron and which minimally include the following events, as applicable:

- a) PSD verification errors or critical NV memory errors, if technically possible to log these events based on the nature and/or severity of the error;
- b) Changes made to game configuration which may alter paytables or hold percentages;
- c) Power resets;
- d) Handpay conditions;
- e) Door open errors and door close events;
- f) Logic area access events;
- g) Coin, token, and hopper errors;
- h) Bill validator errors;
- i) Hardware errors for patron identification components;
- j) Low NV battery errors;
- k) Reel spin, mechanical device, or smart patron interaction device errors, if any of these errors directly impact game outcome; and
- l) Printer errors.

2.10.2 Non-Wager Purchase Log.

The last 10 non-wager purchases for gaming machines shall be stored in a secure machine log that is not accessible to the patron and which minimally includes the following information:

- a) Unique transaction identification number;

- b) Date and time of the non-wager purchase;
- c) Value of the non-wager purchase in credits and/or United States currency; and
- d) Type of non-wager purchase.

2.10.3 Identifier Log.

If an identifier triggers an action that alters the gaming machine configuration or the outcome of a game, then it shall be recorded in a log file containing the last 10 identifier-based transactions which shall be maintained by the gaming machine or an external system, as applicable. The log file shall contain the following information:

- a) A unique transaction identification number;
- b) An identification number unique to the patron, if known;
- c) The date and time of the transaction;
- d) The criteria for the use of the identifier (skill level of patron, subscriptions, account memberships, patron tracking information, skill requirements of the game, etc.); and
- e) The type of action taken or alteration made to the game (e.g., game rule change, payable change, or other configuration change related to game outcome).

2.10.4 Transaction Log.

The gaming machine shall have the ability to recall the last thirty-five (35) transactions that incremented any of the meters related to bills, wagering instruments, Electronic Funds Transfer (EFT), patron account, and other cashless transactions. The following information must be displayed:

- a) The transaction value in United States currency in numerical form;
- b) The time of day of the transaction, in twenty-four (24) hour format showing hours and minutes;

- c) The date of the transaction, in any recognized format, indicating the day, month, and year;
- d) For wagering instrument transactions, the validation number where only the last four (4) digits may be displayed for wagering instrument out transactions where the wagering instruments are yet to be redeemed; and
- e) For patron account and other cashless transactions:
 - i. The type of transaction (upload/download) including restrictions (cashable, non-cashable, etc.); and
 - ii. The account number or a unique transaction number, either of which can be used to authenticate the source of the funds (i.e. where funds came from/went to).

NOTE: *It is acceptable for bills and wagering instruments accepted by the bill validator to be omitted from this log if there is a timestamped bill validator recall log maintained which indicates the item type and value for last five (5) items accepted by the bill validator. It is also acceptable for issued wagering instruments to be omitted from this log if there is a timestamped wagering instrument out-log maintained which indicates the above information for the last twenty-five (25) issued vouchers.*

2.11 Electronic Accounting and Occurrence Meters

2.11.1 Electronic Accounting Meters.

Electronic accounting meters shall be at least ten (10) digits in length. These meters shall be maintained in credit units equal to the denomination, or in United States currency. If the meter is being used in dollars and cents format, eight (8) digits must be used for the dollar amount and two (2) digits used for the cents amount. Devices configured for multi-denomination play shall display the units in United States currency. The meter must automatically roll over to zero once its maximum logical value has been reached. Meters shall be labeled so they can be clearly understood in accordance with their function. The required electronic accounting meters are as follows:

- a) Credits Bet (Coin In). The gaming machine must have a meter that accumulates the total value of all wagers, whether the wagered amount results from the insertion of coins, tokens, currency, deduction from a credit meter or any other means. This meter shall:
 - i. Not include subsequent wagers of intermediate winnings accumulated during game play such as those acquired from “double up” games;
 - ii. For chance-based slot machine paytables with a difference in theoretical payback percentage which exceeds four (4); and
 - iii. Percent between wager categories, the gaming machine shall maintain and display coin in meters and the associated theoretical payback percentage, for each wager category with a different theoretical payback percentage, and calculate and display a weighted average theoretical payback percentage for that payable. (*NOTE: Wager categories, as used above, do not apply to keno games or games with skill.*)
- b) Credits Won (Coin Out). The gaming machine must have a meter that accumulates the total value of all credits directly paid by the device as a result of winning wagers, whether the payout is made from the hopper, to a credit meter or by any other means. This meter will not record credits awarded as the result of an external bonusing system or a progressive payout;
- c) Attendant Paid Jackpots. The gaming machine must have a meter that accumulates the total value of credits paid by a casino employee resulting from a

single game cycle, the amount of which is not capable of being paid by the gaming machine itself. This meter will not record credits awarded as the result of an external bonusing system or a progressive payout. This meter is only to include awards resulting from specifically identified amounts listed in the manufacturer's par sheet. Awards which are keyed to the credit meter shall not increment this meter, but shall instead increment the Coin Out or Credits Won meter;

- d) Attendant Paid Cancelled Credits. The gaming machine must have a meter that accumulates the total value paid by a casino employee or by system-based command and which results from a patron initiated cash-out that exceeds the physical or configured capability of the device to make the proper payout amount;
- e) Bill In. The gaming machine must have a meter that accumulates the total value of United States currency accepted by the device;
- f) Voucher In. The gaming machine must have a meter that accumulates the total value of all vouchers accepted by the device;
- g) Voucher Out. The gaming machine must have a meter that accumulates the total value of all vouchers issued by the device;
- h) Electronic Funds Transfer In (EFT In). The gaming machine must have a meter that accumulates the total value of cashable credits electronically transferred from a financial institution to the gaming machine through a cashless wagering system;
- i) Patron Account Transfer In (Wagering Account Transfer In or WAT In). The gaming machine must have a meter that accumulates the total value of cashable credits electronically transferred to the gaming machine from a patron account by means of an external connection between the device and a cashless wagering system;
- j) Patron Account Transfer Out (Wagering Account Transfer Out or WAT Out). The gaming machine must have a meter that accumulates the total value of cashable credits electronically transferred from the gaming machine to a patron account by means of an external connection between the device and a cashless wagering system;
- k) Non-Cashable Electronic Promotion In (NCEP In). The gaming machine must have a meter that accumulates the total value of non-cashable credits electronically transferred to the gaming machine from a patron account by means of an external connection between the device and a cashless wagering system;
- l) Non-Cashable Electronic Promotion Out (NCEP Out). The gaming machine must have a meter that accumulates the total value of non-cashable credits

- electronically transferred from the gaming machine to a patron account by means of an external connection between the device and a cashless wagering system;
- m) Coupon Promotion In. The gaming machine must have a meter that accumulates the total value of all coupons accepted by the device;
 - n) Coupon Promotion Out. The gaming machine must have a meter that accumulates the total value of all coupons issued by the device;
 - o) Machine Paid External Bonus Payout. The gaming machine must have a meter that accumulates the total value of additional amounts awarded as a result of an external bonusing system and paid by the device;
 - p) Attendant Paid External Bonus Payout. The gaming machine must have a meter that accumulates the total value of amounts awarded as a result of an external bonusing system paid by a casino employee. Bonus payouts which are keyed to the credit meter, shall not increment this meter, but instead shall be metered to Machine Paid External Bonus Payout;
 - q) Machine Paid Progressive Payout. The gaming machine must have a meter that accumulates the total value of credits paid as a result of progressive awards paid directly by the device. This meter does not include awards paid as a result of an external bonusing system;
 - r) Attendant Paid Progressive Payout. The gaming machine must have a meter that accumulates the total value of credits paid by a casino employee as a result of progressive awards that are not capable of being paid by the device itself. Progressive payouts which are keyed to the credit meter shall not increment this meter, but shall instead be metered to Machine Paid Progressive Payout. This meter shall not include awards paid as a result of an external bonusing system;
 - s) Non-Wager Purchase. The gaming machine that makes use of a non-wager purchase must have a meter that accumulates all credits deducted from the credit meter paid for such purchase. A non-wager purchase is a purchase made by the patron that debits the credit meter and which is used for entertainment purposes only and does not influence the outcome of the game; and
 - t) Other Meters. A gaming machine that allows for additions to, or deductions from, the credit meter, that would not otherwise be metered under any of the above electronic accounting meters, must maintain sufficient meters to properly reconcile all such transactions.

NOTE: Any accounting meter that is not supported by the functionality of the gaming machine, is not required to be implemented by the supplier.

2.11.2 Electronic Occurrence Meters.

Occurrence meters shall be at least eight (8) digits in length however, are not required to automatically roll over. Meters shall be labeled so they can be clearly understood in accordance with their function. The required electronic occurrence meters are as follows:

- a) Games Played. The gaming machine must have meters that accumulates the number of games played:
 - i. Since power reset;
 - ii. Since external door close; and
 - iii. Since game initialization (NV memory clear).
- b) External Doors. The gaming machine must have meters that accumulate the number of times any external door that allows access to the locked logic area or currency compartment (e.g., main or belly door, drop box door, currency area with an external door, etc.) was opened since the last NV memory clear, provided power is supplied to the device;
- c) Stacker Door. The gaming machine must have a meter that accumulates the number of times the stacker door has been opened since the last NV memory clear provided power is supplied to the device;
- d) Progressive Occurrence. The gaming device must have a meter that accumulates the number of times each progressive is awarded. This rule requires that the controller, whether internal to the gaming machine itself, or external, shall support this occurrence meter for each progressive level offered;
- e) Bill Denomination. The gaming device must have a specific occurrence meter for each denomination of currency accepted by the gaming machine; and
- f) Wagering Instruments Accepted. The gaming machine must have a specific occurrence meter that records the number of all wagering instruments accepted by the gaming machine.

NOTE: Any occurrence meter that is not supported by the functionality of the gaming machine, is not required to be implemented by the supplier.

2.11.3 Paytable-Specific Meters.

In addition to the electronic accounting meters required above, each individual game available for play shall have the paytable-specific meters 'Credits Bet' and 'Credits Won' in either credits or United States currency. Even if a double-up or gamble game is lost, the win amount and the credits bet amount for the primary game shall be recorded in the paytable-specific meters. Additionally, it is recommended that the game support paytable-specific meters for "Number of Games Played".

NOTE: Primary game is defined to be the base game and includes amounts won from free spins, bonus games, etc. before the double up game or gamble game is played.

2.11.4 Double-Up / Gamble Meters.

For each type of double-up or gamble feature offered, there shall be sufficient meters to determine the feature's actual return percentage, which shall increment accurately every time a double-up or gamble play concludes, including:

- a) Double-up / gamble amount wagered;
- b) Double-up / gamble amount won;
- c) Double-up / gamble games played; and
- d) Double-up / gamble games won.

2.12 Game Display Devices

2.12.1 Mechanical Display Devices.

If the machine has microprocessor-controlled mechanical display devices (e.g., reels or wheels) which are used for displaying game outcomes, the following rules shall be observed:

- a) Mechanical display devices shall have a sufficiently closed loop of control so as to enable the software to detect malfunctions such as a reel/wheel which is jammed, not spinning freely, or manipulated from its final resting position. This requirement is designed to ensure that if a reel or wheel is not in the position it is supposed to be in, an error condition will be generated. This shall be detected under the following conditions:
 - i. A mis-index condition for rotating reels/wheels that affects the outcome of the game; or
 - ii. In the final positioning of the reel/wheel, if the position error exceeds one-half of the width of the smallest symbol excluding blanks on the reel/wheel artwork.
- b) If the gaming machine detects a malfunction related to the operation of any related mechanical display device, it shall tilt and cease game play, provide an appropriate error message (including the specific reel/wheel number when applicable), disable credit acceptance, and activate the device alert mechanism. This error condition shall be communicated to the electronic monitoring system, when such a compatible system and protocol is supported, and shall not be cleared automatically;
- c) Mechanical display devices shall have a mechanism that ensures the correct mounting of the assembly's artwork, if applicable;
- d) Mechanical display devices shall be constructed in such a way that winning symbol combinations align properly with paylines or other applicable pay indicators;
- e) A display assembly for a mechanical display device shall be designed such that it is not obstructed by any other components; and
- f) Mechanical display devices shall reset automatically to the last valid reel/wheel position when game play mode is re-entered, and the reel/wheel positions have

been altered (e.g., after the main door is closed, power is restored, test/diagnostic mode is exited, or an error condition is cleared).

2.12.2 Video Displays Devices.

If a machine is equipped with a video display device (including a monitor), the following rules shall be observed:

- a) The video display device shall fit properly into the machine and the surrounding bezel in a manner that eliminates gaps or voids, resists the entry of objects, and which does not physically obscure or cover any required game display information;
- b) The resolution of the configured video display device shall:
 - i. Be compatible with one or more of the resolutions supported by the control programme software in a manner that ensures the intended function of the video display device; and
 - ii. Not clip or fail to display any information critical to game play.
- c) Video display devices that support touch screen functionality shall meet the following rules:
 - i. Touch screen displays shall be accurate, and if required by their design, shall support a calibration method to maintain that accuracy; alternatively, the display hardware may support automatic self-calibration; and
 - ii. If applicable to design, a touch screen display shall be capable of being manually re-calibrated without access to the gaming machine cabinet other than opening the main door.

NOTE: Please reference section entitled "Touch Screen Displays" for requirements applicable to video display devices that support touch screen functionality.

2.13 Patron Interaction Devices

2.13.1 Maintenance of Patron Interaction Devices.

A gaming machine that incorporates one or more patron interaction devices that impact game outcome shall:

- a) Monitor any smart patron interaction device that supports two-way communications with the gaming machine to determine if it is offline or not communicating. Upon detection of an offline condition, the gaming machine must tilt unless an alternative interface mechanism is available to the patron; and
- b) Support a manual test mode accessible to the operator that checks the electrical continuity of the patron interaction device and which allows the operator to assess the functional health of the device, as per its intended design.

2.14 Machine Communications Protocol

2.14.1 Integrity of Protocol Communications.

For gaming machines that are designed to support communications with an electronic monitoring system, the device shall accurately function as indicated by the communications protocol that is implemented, and as required by the Commission, including, but not limited to, protocol-based metering and remote verification of the control programme, where supported. In addition, the following rules shall be met:

- a) The gaming machine shall be designed or programmed such that it may only communicate with authorized system components through secure communications;
- b) With the exception of 'disable' commands, communications shall not negatively impact patron interaction on the gaming machine, including a patron's access to all screen displays;
- c) After a program interruption, any communications to an external device shall not begin until the program resumption routine, including any self-test, is completed successfully; and
- d) Pursuant to regulation 165(7), the communication interface on any gaming machine shall be installed in as secure a manner as reasonably practicable to prevent unauthorized access.

2.14.2 Protection of Sensitive Information.

The gaming machine shall not allow any information contained in communication to or from the electronic monitoring system that is intended by the communication protocol to be protected, or which is of a sensitive nature, to be viewable through any display mechanism supported by the device. This includes, but is not limited to, validation numbers, secure PINs, patron credentials, or secure seeds and keys.

2.14.3 Gaming Machine Communication.

Any gaming machine which is capable of bidirectional communication with internal or external associated equipment, or other equipment, shall utilize a robust communication protocol which ensures that erroneous data or signals do not adversely affect the integrity or operation of the device.

2.14.4 Cashless Wagering System Communication.

For communications between the gaming machine and the Cashless Wagering System, the following requirements shall apply:

- a) Pursuant to regulation 166(7), any gaming machine that holds information relating to cashless transactions in its memory shall not have means to compromise the information and shall not allow the removal of its information until that information has been successfully transferred and acknowledged by the Cashless Wagering System; and
- b) Pursuant to regulation 168(5), if communication between the Cashless Wagering System and the gaming machine is lost, a message must be displayed to the patron that cashless transactions cannot currently be processed, and the gaming machine must not permit further wagering. In addition, the casino must be immediately notified of that loss. It is permissible for the gaming machine to detect this error when the gaming machine tries to communicate with the system.

2.15 Machine Connections to the Internet

2.15.1 General Statement.

Gaming machines may be designed to connect to, or otherwise communicate over, servers or networks via the internet.

2.15.2 Internet Connections.

The following requirements shall apply to gaming machines supporting an internet connection or access to a public network:

- a) The gaming machine shall not be directly connected to the internet / public network; a gaming machine shall only be connected to the internet / public network when utilizing a method that securely isolates the gaming machine from that external network, for example, through an approved firewall mechanism; and
- b) The gaming machine shall support adequate network security measures to ensure all data transmitted between the gaming network and the internet / public network is encrypted and utilizes Virtual Private Network (VPN), Secure Socket Layer (SSL), Internet Protocol Security (IPS), or some other accepted methodology approved by the Commission for securing data transmissions.

NOTE: It is recommended that routine field audits be conducted to ensure that production network configurations satisfy these requirements.

2.16 Multi-Patron Machine

2.16.1 General Statement.

A multi-patron machine is a gaming machine consisting of multiple patron interfaces linked to a shared master console.

2.16.2 Master Console.

The master console shall coordinate game play in a manner that is consistent across all patron interfaces. The master console shall coordinate game display consistently among the patron interfaces and must meet any applicable machine and game requirements contained within this document.

2.16.3 Patron Interfaces.

The patron interfaces support patron interaction devices as well as devices for credit acceptance and issuance. The following rules shall apply to each patron interface comprising a multi-patron machine:

- a) Each individual patron interface shall be capable of being independently monitored by an electronic monitoring system, when such a compatible system or protocol is supported;
- b) Each patron interface shall meet the applicable standards outlined throughout this document, including gaming machine identification and metering;
- c) Each patron interface shall be designed such that the actions of, or results obtained by any one patron, do not affect the outcome(s) of any other patron, unless otherwise denoted by the game rules;
- d) In the event of a malfunction of any patron interface, which could include, but is not limited to, a loss of communication with the master console, each malfunctioning or non-communicating patron interface shall immediately enter into an unplayable mode and must display a suitable tilt message;

- e) In the event of a master console malfunction, all patron interfaces shall enter into an unplayable mode and must display a suitable tilt message;
- f) There shall be a method provided by a multi-patron machine for each patron to know when the next game will begin; and
- g) All patron interfaces shall utilize a compatible version of software and must employ consistent configurations of that software.

CHAPTER 3: PERIPHERALS AND PAYMENTS

3.1 Introduction

3.1.1 General Statement.

This chapter sets forth the various peripheral and payment requirements for gaming machines. A peripheral is defined as an internal or external device connected to the gaming machine that supports credit acceptance, credit issuance, patron identification, or other specialized function(s) which are for game play.

3.2 Wagering Instruments

3.2.1 Wagering Instrument Usage.

Use of a virtual or printed wagering instrument, such as a voucher or coupon, as a method of credit acceptance and/or redemption is only permissible when:

- a) The gaming machine is linked to a cashless wagering system which allows for the validation of the wagering instrument. For credit redemption, provisions must be made if communication is lost and validation information cannot be sent to the cashless wagering system, thereby requiring the manufacturer to support some alternate method of payment; or
- b) Utilizing an approved alternative method that includes the ability to identify duplicate wagering instruments to prevent fraud through the redemption of a wagering instrument that was previously issued by the gaming machine.

3.2.2 Wagering Instrument Information.

A wagering instrument shall contain the following information at a minimum:

- a) Casino name / site identification (for a printed wagering instrument, it is permissible for this information to be contained on the ticket stock itself);
- b) Machine identification number;
- c) Date and time;
- d) Alpha value of the wagering instrument in local monetary units;
- e) Numeric value of the wagering instrument in local monetary units;
- f) Wagering instrument sequence number;
- g) Validation number (and which for a printed paper wagering instrument, must appear on the leading edge of the ticket);
- h) Bar code or any machine-readable code representing the validation number;
- i) Indication if the wagering instrument is a “duplicate”, assuming duplicate wagering instruments may be printed by the gaming machine;
- j) Type of transaction or other method of differentiating wagering instrument types (assuming multiple voucher types are available). Additionally, it is strongly recommended that whenever the wagering instrument type is itself a receipt, that the wagering instrument explicitly states that it has “no cash value” or other equivalent wording; and
- k) Indication of an expiration period from date of issue, or date the wagering instrument will expire (for a printed paper wagering instrument, it is permissible for this information to be contained on the ticket stock itself).

NOTE: Some of the above-listed information may also be part of the validation number or barcode. Multiple barcodes are allowed and may represent more than just the validation number.

3.2.3 Online Wagering Instrument Issuance.

The gaming machine may pay the patron by issuing a printed or virtual wagering instrument that contains the information as indicated in the section entitled “Wagering instrument Information” above. Additionally, the gaming machine shall support the transmission of the following information to the cashless wagering system regarding each wagering instrument issued, as required by the communications protocol supported:

- a) Value of credits in local monetary units in numerical form;
- b) Time of day the wagering instrument was printed in twenty-four (24) hour format showing hours and minutes;
- c) Date, in any recognized format, indicating the day, month, and year;
- d) Gaming machine asset number; and
- e) Validation number.

3.2.4 Offline Wagering Instrument Issuance.

The gaming machine shall meet the following minimum set of requirements to support the issuance of offline wagering instruments after a loss of communication with the cashless wagering system has been identified:

- a) The gaming machine shall not issue more offline wagering instruments than it has the ability to retain and display in the wagering instrument out log;
- b) The gaming machine shall not request validation numbers, or values for seeds, keys, etc. used in the issuance of wagering instruments, until all outstanding offline wagering instrument information has been fully communicated to the cashless wagering system;
- c) The gaming machine shall request a new set of validation numbers, seeds, keys, etc. if the current list has the possibility of being compromised;
- d) The values for the seeds, keys, etc. shall never be viewable through any display supported by the gaming machine; and
- e) An “offline authentication identifier” shall be included on the wagering instrument. For printed paper wagering instruments, this identifier must appear on the next line immediately following the leading-edge validation number that in no way overwrites, or otherwise compromises, the printing of the validation number on the wagering instrument (not required for wagering instruments that are non-redeemable at a gaming machine). The offline authentication identifier must be derived by a hash, or other secure encryption method of at least 128 bits, that will uniquely identify the wagering instrument, verify that the redeeming system was also the issuing system, and validate the amount of the wagering instrument. For

cases where a suitable authentication identifier is not included on the wagering instrument, the gaming machine must issue, at most, one wagering instrument after the communications between the gaming machine and the system have been lost.

3.3 Bill Validators and Stackers

3.3.1 General Statement.

For gaming machines that support a bill validator, the requirements defined within this section apply.

3.3.2 Bill Validators.

Bill validators shall be constructed in a manner that ensures proper handling of inputs and that protects against vandalism, abuse, or fraudulent activity. In addition, bill validators shall meet the following rules:

- a) A bill validator shall be electronically-based and be configured to ensure that it detects the entry of valid bills and wagering instruments, such as coupons and vouchers, and provides a method to enable the software to interpret and act appropriately upon a valid or invalid input;
- b) Invalid bills and wagering instruments must be rejected and shall be returned to the player;
- c) Credits shall only be registered when:
 - i. The bill or wagering instrument has passed the point where it is accepted and stacked; or

- i. The bill validator has sent the "irrevocably stacked" message to the gaming machine.
- d) Each bill validator shall be designed to prevent the use of cheating methods such as stringing, the insertion of foreign objects, and any other manipulation that may be deemed a cheating technique. Appropriate correlating error conditions shall be generated, and the bill validator shall be disabled;
- e) A method for detection of counterfeit bills must be implemented. Counterfeit bills shall be rejected with a high degree of accuracy; and
- f) Acceptance of any bills or wagering instruments for crediting to the credit meter shall only be possible when the gaming machine is enabled for play and, for redeeming wagering instruments, communicating with the cashless wagering system. Other states, such as error conditions including door opens, shall cause the disabling of the bill validator.

3.3.3 Credit Acceptance.

Each valid bill or wagering instrument shall register on the credit meter the actual monetary value in United States currency, or the appropriate number of credits received for the denomination being used. If registered directly as credits, the conversion rate shall be clearly stated, or be easily ascertainable from the gaming machine. For fractional credits, the gaming machine shall either:

- a) Automatically issue a wagering instrument that reflects any fractional credits; or
- b) Post to the credit meter the entire amount inserted, and either
 - i. Display the current credit meter in United States currency or
 - ii. Inform the patron that there are fractional credits stored on the device at an opportune time to avoid the possibility of the patron walking away from the gaming machine without such knowledge.

3.3.4 Bill Validator Error Conditions.

If a bill validator error condition as listed below is identified, the gaming machine shall display an appropriate error message, disable the bill validator, and activate the device alert mechanism or flash lights with respect to the bill validator itself. This error condition shall be communicated to the electronic monitoring system, when such a compatible system and protocol is supported:

- a) Stacker full; it is recommended that an explicit “stacker full” error message not be utilized since this may promote a security issue; rather, a message such as “Bill Validator Malfunction” or similar is suggested;
- b) Bill or wagering instrument jams;
- c) Bill validator communication failure; and
- d) Stacker removed; the gaming machine shall cease play, provided power is supplied to the device.

3.3.5 Power Failures During Bill Validator Acceptance.

If a power failure occurs during acceptance of a bill or wagering instrument, the bill validator shall give proper credits or return the bill or wagering instrument. There may be a small window of time where power may fail and credit may not be given due to the timing of validating the bill or wagering instrument. However, in this case, the timing window shall be less than one (1) second.

3.3.6 Bill Validator Stacker.

Each bill validator shall have a secure stacker and all accepted items shall be deposited into the secure stacker receptacle. The secure stacker and its receptacle must be attached to the gaming machine in such a manner so that they cannot be easily removed by physical force and shall meet the following rules:

- a) There shall be a separate keyed lock to access the stacker area. This keyed lock shall be separate from the main door. In addition, a separate keyed lock shall be required to remove the bills and wagering instruments from the stacker; and

- b) There must be a method to monitor the stacker door to detect access, as defined elsewhere in this standard under the sections entitled “Door Monitoring” and “Door Open/Close Interruptions”.

3.3.7 Bill Validator Self-Test.

The bill validator shall perform a self-test during each power up. In the event of a self-test failure, the bill validator shall automatically disable itself until the error state has been cleared.

3.3.8 Bill Validator Communications.

All bill validators shall communicate to the gaming machine using a bi-directional protocol.

3.3.9 Bill Validator Settings.

It shall only be possible to conduct preventive maintenance, or perform the following changes or adjustments to bill validators in the field:

- a) The selection of desired acceptance for bills or wagering instruments and their limits;
- b) Changing of certified control programme media or downloading of certified software;
- c) Adjustment of the bill validator for the tolerance level for accepting bills and wagering instruments of varying quality shall not be allowed external to the gaming machine. Adjustments of the tolerance level must only be allowed with adequate levels of security in place. This can be accomplished through lock and key, physical switch settings, or other accepted methods approved on a case-by-case basis by the Commission;
- d) Maintenance, adjustment, and repair per approved factory procedures; and
- e) Options that set the direction or orientation of acceptance.

3.3.10 Bill Validator Location.

If a gaming machine is equipped with a bill validator, it shall be located in a secure area of the device but not within the logic area. Only the bill or wagering instrument insertion area shall be accessible to the patron.

3.4 Patron Identification Components

3.4.1 General Statement.

A patron identification component is peripheral software and/or hardware which supports a means for patrons to provide identification information and/or the source of funds for credit acceptance. Examples of these components include a card reader, a barcode reader, or a biometric scanner.

3.4.2 Card Readers.

Card readers shall be able to detect the use of a valid patron card, as applicable, and provide a method to enable the software to interpret and act appropriately upon a valid or invalid input. The card reader shall be electronically-based and be configured to ensure that it only reads valid cards.

3.4.3 Barcode Readers.

Barcode readers shall be able to associate the barcode visible on a card or wagering instrument, as applicable, with data stored in an external database as a means to identify an account association, or for the purpose of redemption. A barcode reader shall provide a method to enable the software to interpret and act appropriately upon a valid or invalid input.

3.4.4 Biometric Scanners.

Biometric scanners shall be able to associate a person's physical characteristics with those recorded within an external database as means to authenticate the identity of a patron and for the purpose of account association. A biometric scanner shall provide a method to enable the software to interpret and act appropriately upon a valid or invalid input.

3.4.5 Patron Identification Component Requirements.

Patron identification components shall be constructed in a manner that ensures proper handling of inputs and that protects against vandalism, abuse, or fraudulent activity. In addition, patron identification components shall meet the following rules:

- a) The patron identification component shall be designed to prevent manipulation that may impact integrity and shall provide a method to enable the software to interpret and act appropriately upon a valid or invalid input. A method for detection of counterfeiting shall be implemented;
- b) Acceptance of any identification information shall only be possible when the gaming machine is enabled for play and communicating with the cashless wagering system. Other states, such as error conditions including door opens, shall cause the disabling of the patron identification component; and
- c) The gaming machine shall have mechanisms to interpret and act upon an error condition related to a malfunction of any patron identification component, including communication failures. If a patron identification component error condition is identified, the gaming machine shall display an appropriate error message, disable the patron identification component and activate the device alert mechanism or flash lights with respect to the component itself. This error condition shall be communicated to the electronic monitoring system, when such a compatible system and protocol is supported

3.4.6 Patron Identification Component Location.

The patron identification component hardware shall be secured in a locked enclosure or sealed casing or located within a locked area of the gaming machine outside of the logic area (i.e., an area that requires opening of the main door for access). Only the areas of the component that require physical interaction shall be accessible to the patron;

3.5 Payment and Payment Devices**3.5.1 Payments by the Gaming Machine.**

Available credits may be collected from the gaming machine by the patron pressing a collector cash out button at any time other than during:

- a) A game being played (subject to the applicable rules of the game);
- b) Any door open condition;
- c) Test/diagnostic mode;
- d) A credit meter or win meter increment, unless the entire amount is placed on the meters when the collect button is pressed; or
- e) An error condition, provided the error condition prevents a valid cashout which is not supported through some other means.

3.5.2 Collect Meter.

There shall be a collect meter which will show the number of credits or cash collected by the patron upon a cashout. This meter may include handpays. The collect meter must adhere to the following requirements:

- a) The collect meter shall be displayed to the patron upon a cashout event unless a tilt condition or malfunction exists, or unless the patron opts to view an informational screen such as a menu or help screen item; and
- b) The number of credits or cash collected shall be subtracted from the patron's credit meter and added to the collect meter.

3.5.3 Cashout Limit Exceeded.

If credits are collected, and the total credit value is greater than or equal to a specific limit, the gaming machine shall lock up until the credits have been paid, and the handpay or casino employee-paid cancelled credit condition is cleared by the casino employee or via a system-based command.

3.5.4 Printer Location.

If a gaming machine is equipped with a printer, it shall be located within a secure area of the gaming machine, but not be housed within the logic area or the drop box.

3.5.5 Printer Error Conditions.

A gaming machine that is equipped with a printer shall have mechanisms to allow control programme software to interpret and act upon the conditions listed below. It is permissible for the gaming machine to detect these error conditions when the gaming machine tries to print. If a printer error condition is identified, the gaming machine shall display an appropriate error message, disable the printer, and activate the device alert mechanism. The error condition shall be communicated to the electronic monitoring system, when such a compatible system and protocol is supported. Once a printer error condition has been cleared, any unprinted wagering instrument shall be generated or a suitable handpay shall be processed. Printer error conditions shall include:

- a) Printer ink low/out;
- b) Out of paper/paper low;
- c) Printer jam/failure; and
- d) Printer disconnected.

CHAPTER 4: RANDOM NUMBER GENERATOR (RNG) REQUIREMENTS

4.1 Introduction

4.1.1 General Statement.

This chapter sets forth the technical requirements for a Random Number Generator (RNG). The types of RNGs include the following:

- a) Software-based RNGs do not use hardware devices and derive their randomness principally and primarily from a computer-based or software-driven algorithm. They do not incorporate hardware randomness in a significant way;
- b) Hardware-based RNGs derive their randomness from small-scale physical events (e.g., electric circuit feedback, thermal noise, radioactive decay, photon spin, etc.); and
- c) Mechanical RNGs generate game outcomes mechanically, employing the laws of physics (e.g., wheels, tumblers, blowers, shufflers, etc.).

NOTE: See also related requirements found in “Game Outcome Using a Random Number Generator” section as contained in the “Game Requirements” chapter of this standard.

4.2 General Random Number Generator (RNG) Requirements

4.2.1 Source Code Review.

The testing laboratory shall review the source code pertaining to any and all core randomness algorithms, scaling algorithms, shuffling algorithms, and other algorithms or functions that play a critical role in the final random outcome selected for use by a game. This review shall include comparison to published references, where applicable, and an examination for sources of bias, errors in implementation, malicious code, code with the potential to corrupt behavior, or undisclosed switches or parameters having a possible influence on randomness and fair play.

4.2.2 Statistical Analysis.

The testing laboratory shall employ statistical tests to assess the outcomes produced by the RNG, after scaling, shuffling, or other mapping (hereafter referred to as “final outcome output”). The testing laboratory shall choose appropriate tests on a case-by-case basis, depending on the RNG under review and its usage within the game. The tests shall be selected to assure conformance to intended distribution of values, statistical independence between draws, and, if applicable, statistical independence between multiple values within a single draw. The applied tests shall be evaluated, collectively, at a 99% confidence level. The amount of data tested shall be such that significant deviations from applicable RNG testing criteria can be detected with high frequency. In the case of an RNG intended for variable usage, it is the responsibility of the testing laboratory to select and test a representative set of usages as test cases. Statistical tests may include any one or more of the following:

- a) Total Distribution or Chi-square test;
- b) Overlaps test;
- c) Coupon Collector’s test;
- d) Runs test;
- e) Interplay Correlation test;
- f) Serial Correlation test; and

- g) Duplicates test.

4.2.3 Distribution.

Each possible RNG selection shall be equally likely to be chosen. Where the game design specifies a non-uniform distribution, the final outcome shall conform to the intended distribution.

- a) All scaling, mapping, and shuffling algorithms used shall be unbiased, as verified by source code review. The discard of RNG values is permissible in this context and may be necessary to eliminate bias; and
- b) The final outcome output shall be tested against intended distribution using appropriate statistical tests (e.g., Total Distribution test).

4.2.4 Independence.

Knowledge of the numbers chosen in one draw shall not provide information on the numbers that may be chosen in a future draw. If the RNG selects multiple values within the context of a single draw, knowing one or more values shall not provide information on the other values within the draw, unless provided for by the game design.

- a) As verified by source code review, the RNG shall not discard or modify selections based on previous selections, except where intended by game design (e.g., without-replacement functionality); and
- b) The final outcome output shall be tested for independence between draws and, as applicable, independence within a draw, using appropriate statistical tests (e.g., Serial or Interplay Correlation tests, and Runs test).

4.2.5 Available Outcomes.

As verified by source code review, the set of possible outcomes produced by the RNG solution (i.e., the RNG period), taken as a whole, shall be sufficiently large to ensure that all outcomes shall be available on every draw with the appropriate likelihood, independent of previously produced outcomes, except where specified by the game design.

4.3 Random Number Generator (RNG) Strength and Monitoring

4.3.1 Cryptographic RNGs and RNG Attacks.

The RNG used in the determination of game outcomes in a gaming machine shall be cryptographically strong. “Cryptographically strong” means that the RNG is resistant to attack or compromise by an intelligent attacker with modern computational resources, and who may have knowledge of the source code of the RNG. A cryptographic RNG cannot be feasibly compromised by a skilled attacker with knowledge of the source code. At a minimum, cryptographic RNGs shall be resistant to the following types of attack:

- a) Direct Cryptanalytic Attack: Given a sequence of past values produced by the RNG, it shall be computationally infeasible to predict or estimate future RNG values. This shall be ensured through the appropriate use of a recognized cryptographic algorithm (RNG algorithm, hash, cipher, etc.). Note that a hardware-based RNG or a mechanical RNGs may potentially qualify as a cryptographic algorithm, provided it passes statistical testing;
- b) Known Input Attack: It shall be infeasible to computationally determine or reasonably estimate the state of the RNG after initial seeding. In particular, the RNG shall not be seeded from a time value alone. The manufacturer shall ensure that games will not have the same initial seed. Seeding methods shall not compromise the cryptographic strength of the RNG; and
- c) State Compromise Extension Attack: The RNG shall periodically modify its state, through the use of external entropy, limiting the effective duration of any potential exploit by a successful attacker.

NOTE: Because of continuous computational improvements and advances in cryptographic research, compliance to this criterion shall be re-evaluated as required by the Commission.

4.3.2 Dynamic Output Monitoring for Hardware RNGs.

Due to their physical nature, the performance of hardware-based RNGs may deteriorate over time or otherwise malfunction, independent of the gaming machine. The failure of a hardware-based RNG could have serious consequences for the intended usage of the RNG. For this reason, if a hardware-based RNG is used, there shall be dynamic monitoring of the output by statistical testing. This monitoring process shall disable game play when malfunction or degradation is detected.

4.4 Mechanical Random Number Generator (RNG) (Physical Randomness Device)

4.4.1 General Statement.

The requirements defined within this section apply to mechanical RNGs or “physical randomness devices”. While software may be a part of the device, the software is primarily limited to operating machinery and/or reading and recording game outcome data (the software does not play a deterministic role in determining the game outcome).

NOTE: Devices which faithfully and mechanically create or display a game outcome selected by a computer RNG are not considered physical randomness devices and shall be tested as RNGs, once the faithful reproduction of RNG selected outcome has been assured. Physical randomness devices may incorporate RNGs in secondary roles (e.g., rotation speed). Such secondary RNGs need not be evaluated against the RNG requirements contained herein, as they do not directly select the game outcome. Rather, the physical randomness device shall be tested as a whole, as described in this section.

NOTE: The approved components of a physical randomness device cannot be swapped out or replaced with unapproved components, as they are integral to the behavior and performance of the physical randomness device. The “approved components” in this context include those physical items that produce the random behavior – e.g., balls in a mixer, cards in a shuffler, etc. As one example, a shuffler certified by the testing laboratory to utilize plastic cards cannot be viewed as an approved equivalent to the same mechanical shuffler using paper cards.

4.4.2 Data Collection Amount.

To provide best assurance of random behavior, the testing laboratory shall collect game outcome data for at least 10,000 game outcomes. The data collection shall be accomplished in a fashion reasonably similar to the intended use of the device in the field. In particular, the recommended setup and calibration shall be executed initially, and the device and components (cards, balls, etc.) shall be replaced or serviced during the collection period as recommended by the manufacturer.

NOTE: Due to feasibility concerns associated with reasonable data collection on some devices, the Commission may elect to accept testing results from a smaller collection amount on a case-by-case basis. Equally possible, a larger data collection sample may be required. Regardless, the testing laboratory will clearly state in the applicable certification, the amount of data used for testing. When less than 10,000 games are used, a statement on the statistical limitations of reduced testing will be clearly denoted within the certification report.

4.4.3 Durability.

All mechanical pieces shall be constructed of materials to prevent degradation of any component over its intended lifespan.

NOTE: The testing laboratory may recommend a stricter replacement schedule than that suggested by the manufacturer of the device to comply with the 'Durability' requirement stated above. In addition, the testing laboratory may recommend periodic inspection of the device to ensure and maintain its integrity.

4.4.4 Tampering.

The patron / casino operator shall not have the ability to manipulate or influence the physical randomness devices in a physical manner with respect to the production of game outcome data, except as intended by game design.

CHAPTER 5: GAME REQUIREMENTS

5.1 Introduction

5.1.1 General Statement.

This chapter sets forth technical requirements for the patron interface, rules of play, game fairness, game selection, game outcome, related patron displays and artwork, payout percentages and odds, bonus games, game history recall, game modes, common features, games with skill, tournaments, and other game requirements.

NOTE: Please reference the “Games with Skill” section of this equipment standard for specific and supplemental requirements for games containing one or more skill elements.

5.2 Patron Interface

5.2.1 General Statement.

The patron interface is defined as the interface in which the patron interacts with the game, including the touch screen(s), button panel(s), or other forms of patron interaction devices.

5.2.2 Patron Interface Rules.

The patron interface shall meet the following requirements:

- a) Any resizing or overlay of the patron interface screen shall be mapped accurately to reflect the revised display and touch points;
- b) All patron-selectable touch points or buttons represented on the patron interface that impact game play and/or the integrity or outcome of the game shall be clearly labeled according to their function and shall operate in accordance with applicable game rules;
- c) There shall be no hidden or undocumented touch points or buttons anywhere on the patron interface that affect game play and/or that impact the integrity or outcome of the game, except as provided for by the game rules;
- d) The display of the instructions and information shall be adapted to the patron interface. For example, where a device uses technologies with a smaller display screen, it is permissible to present an abridged version of the game information accessible directly from within the game screen and make available the full/complete version of the game information via another method, such as a secondary screen, help screen, or other interface that is easily identified on the visual game screen; and
- e) Where multiple items of instructions and information are displayed on the patron interface, it is acceptable to have this information displayed in an alternating fashion provided that, the rate at which information alternates permits a patron a reasonable opportunity to read each item.

5.2.3 Simultaneous Inputs.

Simultaneous or sequential activation of various patron interaction devices comprising a patron interface shall not cause gaming machine malfunctions and must not lead to results that are contrary to a game's design intent.

5.3 General Game Requirements

5.3.1 Gaming Sessions.

Pursuant to Regulation 30(12), a gaming session is defined as the period of time that begins when a patron initiates a game or series of games on a gaming machine by placing a wager and ends at the time of a final game outcome for that game or series of games. The end of a gaming session is also coincident with the opportunity for the patron to exit the game or retrieve their credit balance.

NOTE: This standard is not intended to preclude or prohibit designs that allow the simultaneous play of multiple games themes on a gaming machine. Where multiple game themes are accessible simultaneously, patrons may play more than one game at a time in separate gaming sessions. However, in such a case, metering and applicable limits shall be enforced against each available game, as it is played, and all other requirements within this chapter shall continue to apply to these multiple game-in-play designs.

5.3.2 Game Cycle.

A game cycle consists of all patron actions and game activity that occur from wager to wager. Where multiple games are accessible simultaneously, patrons may play more than one game cycle at a time in separate instances of the gaming window. The following requirements apply to a traditional game cycle:

- a) Game cycle initiation shall be defined to be:
 - i. After the patron places a wager or commits a bet; and/or
 - ii. After the patron presses a "play" button or performs a similar action to initiate a game in accordance with the game rules.
- b) Credits wagered or committed at any point at the start of, or within the course of play shall be immediately subtracted from the patron's credit meter;
- c) The following game elements shall be considered to be part of a single game cycle:

- i. Games that trigger a free game bonus/feature and any subsequent free games;
 - ii. “Second screen” bonus feature(s);
 - iii. Games with patron choice (e.g., draw poker or blackjack);
 - iv. Games where the rules permit wagering of additional credits (e.g., blackjack insurance, or the second part of a two-part keno game); and
 - v. Double-up/gamble features.
- d) A game cycle shall be considered complete when all funds wagered are lost or when the final transfer to the patron’s credit meter takes place. The value of every prize at the end of a game shall be added to the patron’s credit meter, except for handpays or merchandise.

5.3.3 Information to be Displayed.

Pursuant to Regulation 30(3)(c), the gaming machine shall display in an accurate and non-misleading manner the following information whenever credits are available for play, with the exception of when the patron is viewing an informational screen such as a menu or help screen as applicable:

- a) The mode and rules of play;
- b) The amount required to wager on the game or series of games in a gaming session;
- c) The amount to be paid on winning wagers;
- d) Any rake or fee charged to play the game or series of games in a gaming session;
- e) Any monetary wagering limits for games that are representative of live games;
- f) Current credits available for wagering;
- g) Denomination being played;
- h) Current total amount wagered by the patron and placement of all active wagers, or sufficient display information to otherwise derive these parameters;
- i) Any patron wager options that occur prior to game initiation, or during the course of game play;

- j) For the last completed game, the following information until the next game starts, wager options are modified, or the patron exits the game;
 - i. Accurate representation of the game outcome and any additional information sufficient for the patron to reasonably understand the game outcome;
 - ii. Amount won; and
 - iii. Any patron wager options in effect.

5.3.4 Credit Meter.

With the exception of when the patron is viewing an informational screen such as a menu or help screen item, the credit meter shall be displayed to the patron unless a tilt condition or malfunction exists that impacts its proper display. Additionally, the credit meter shall conform to the following requirements:

- a) The credit meter shall be visible to the patron at any time a wager may be placed, at any time credit acceptance or credit redemption is allowed, or at any time the meter is actively being incremented or decremented;
- b) The credit meter shall be displayed in credits or United States currency format. If the game's credit meter allows for toggling between credits and currency, this functionality shall be easily understood by the patron. The credit meter shall clearly indicate whether credits or currency are currently being displayed;
- c) If the current United States currency amount is not an even multiple of the denomination for a game, or the credit amount has a fractional value, the credits displayed for that game may be displayed and played as a truncated amount, (i.e., fractional part removed). However, the fractional credit amount shall be made available to the patron when the truncated credit balance is zero.
- d) If restricted incentive credits and unrestricted patron funds are combined on one (1) credit meter, restricted incentive credits shall be wagered first, as allowed by the rules of the game, before any unrestricted patron funds are wagered.
- e) Any patron-selectable option to hide the display of the credit meter must be securely configurable on the gaming machine and default to disabled.

5.4 Game Information and Rules of Play

5.4.1 Game Information and Rules of Play.

The following requirements apply to the game information, artwork, paytables, and help screens including any written, graphical, and auditory information provided to the patron by the gaming machine:

- a) Patron interface and patron interaction device usage instructions, payable information, and rules of play shall be complete and unambiguous and shall not be misleading or unfair to the patron;
- b) If there are multiple patron interaction devices able to affect the same patron action, then all such options shall be clearly explained to the patron;
- c) Help screen information shall be accessible by a patron without the need for credits on the game or commitment of a wager. This information shall include descriptions of unique game features, extended play, free spins, double-up, autoplay, countdown timers, symbol transformations, community style bonus awards, etc.;
- d) Pursuant to Regulation 143(1), information on minimum and maximum wagers, and other available wagers shall be stated within, or be able to be deduced from, the artwork, with adequate instruction for any available wager option;
- e) Paytable information shall include all possible winning outcomes and combinations, along with their corresponding payouts, for any available modifiers and/or wager options;
- f) The artwork shall clearly indicate whether awards are designated in credits, currency, or some other unit;
- g) For artwork that contains game instructions explicitly advertising a credit award or merchandise prize, it shall be possible to win the advertised award/prize from a single game, or series of games enabled by an initiating game, when including features, bonuses, or other game options, or the artwork must clearly specify the criteria necessary to win the advertised award/prize;
- h) The game shall reflect any change in award value, which may occur during the course of play. This may be accomplished with a digital display in a conspicuous location of the patron interface. With the exception of progressive jackpots, the

- game shall clearly state the criteria for which any award value is modified;
- i) Game instructions that are presented aurally shall also be presented in written form within the artwork;
 - j) Game instructions shall be rendered in a color that contrasts with the background color to ensure that all instructions are clearly visible/readable;
 - k) The artwork shall clearly state the rules for payments of prizes. If a specific winning combination is paid where multiple wins are possible, then the payment method shall be described:
 - i. The artwork shall clearly communicate the treatment of coinciding game outcomes. For example, whether or not a straight flush is construed as both a flush and a straight, or if 3/4/5 of a kind can be construed as paying all of kind or just the highest. Where a payline may be interpreted to have more than one such winning combination, there must be a statement if only the highest winning combination is paid per line;
 - ii. Where the same symbol can qualify for a line pay and scatter pay simultaneously. or where line and scatter pays occur simultaneously on the same line, the artwork shall indicate if the patron will be paid for both wins, or the greater of the two; and
 - iii. The artwork shall clearly communicate the treatment of coinciding scattered wins with respect to other possible scattered wins. For example, the artwork must state whether combinations of scattered symbols pay all possible prizes or only the highest prize.
 - l) Where multiplier instructions are displayed in artwork, it shall be clear what the multiplier does and does not apply to;
 - m) All game symbols/objects shall be clearly displayed to the patron and must not be misleading:
 - i. Game instructions that specifically correspond to one or more symbols/prizes, shall be clearly associated with those symbols/prizes. For example, this may be achieved with appropriate framing or boxing. Additional wording such as “these symbols” may also be used;
 - ii. If game instructions refer to a particular symbol, and the written name for the symbol may be mistaken for another symbol, or may imply other characteristics, then the visual display of the instructions shall clearly indicate to which symbol the instruction refers;

- iii. Game symbols and objects shall retain their shape throughout all artwork, except while animation is in progress. Any symbol that changes shape or color during an animation process shall not appear in a way that can be misinterpreted to be some other symbol defined in the paytable;
 - iv. If the function of a symbol changes (e.g., a non-substitute symbol becomes a substitute symbol during a feature), or the symbol's appearance changes, the artwork shall clearly indicate this change of function or appearance and any special conditions that apply to it; and
 - v. If limitations exist with respect to the location and/or appearance of any symbol, the limitation shall be disclosed in the artwork. For example, if a symbol is only available in a bonus game, or on a specific reel strip, then the artwork must disclose this.
- n) The artwork shall clearly state which symbols/objects may act as a substitute or wild, and in which winning combinations the substitute or wild may be applied; this description must address any/all phases of game play where a wild or substitute symbol operates;
 - o) The artwork shall clearly state which symbols/objects may act as a scatter and in which winning combinations the scatter may be applied;
 - p) The artwork shall contain textual and/or graphical information to clearly explain the order in which symbols are to appear, in order for a prize to be awarded or a feature to be triggered, including numbers to indicate how many correct symbols/objects each pattern corresponds to;
 - q) The game shall not advertise 'upcoming wins', for example, "three (3) times pay coming soon", unless the advertisement is accurate and mathematically demonstrable, or unless the patron has a direct advertisement of the current progress to that win (e.g., they have two (2) of four (4) tokens collected that are required to win a prize);
 - r) The game artwork shall clearly explain to the patron any non-wager purchase option and its value in credits or United States currency;
 - s) The artwork shall disclose any restrictive features of game play, such as any play duration limits, maximum win values, etc. which are implemented as an element of game design;
 - t) For games representative of live games, the artwork shall disclose any monetary wagering limits [CGR2018 4-30(3)(c)(v)];
 - u) The artwork shall display such additional information sufficient for the patron to

reasonably understand the game outcome [CGR2018 4-30(3)(c)(viii)]; and

- v) It is recommended that a disclaimer stating “Malfunction Voids all Pays” or some equivalent verbiage be clearly displayed on the gaming machine.

5.4.2 Multi-Wager Games.

Pursuant to Regulation 30(3)(c), the following requirements shall apply, as relevant to the specific game design, to games where multiple, independent wagers can simultaneously be applied towards advertised awards:

- a) Each individual wager placed shall be clearly indicated so that the patron is in no doubt as to which wagers have been made and the credits bet per wager;
- b) The winning amount for each separate wager, and total winning amount, shall be displayed on the game screen; and
- c) Each winning prize obtained shall be displayed to the patron in a way that clearly associates the prize to the appropriate wager. Where there are wins associated with multiple wagers, each winning wager may be indicated in turn. In cases where there is a multitude of wager information to convey, a summary screen may suffice. Any exceptions will be reviewed by the testing laboratory on a case-by-case basis.

5.4.3 Line Games.

The following requirements apply, as relevant to the specific game design, to line games:

- a) For multi-line games, the game shall provide a summary display of the paylines that are available to form winning combinations;
- b) Each individual line to be played shall be clearly indicated by the game so that the patron is in no doubt as to which lines are being wagered upon. Displaying the number of wagered lines shall be sufficient to meet this requirement;
- c) For games that permit multiple credits to be wagered on selected lines, the artwork shall:

- i. For linear pays, clearly state that the win(s) for each selected line will be multiplied by the bet multiplier; or
 - ii. For non-linear pays, convey all possible wagers and their awards.
- d) The bet multiplier shall be shown. It is acceptable if this may be easily derived from other displayed information;
- e) The artwork shall indicate any rules and/or limitations which pertain to how pays are evaluated, including an indication of:
 - i. How line wins are evaluated (i.e., left to right, right to left, or both ways);
 - ii. How individual symbols are evaluated (i.e., whether pays are awarded on adjacent reels only, or as scatter pays); and
- f) Winning paylines shall be clearly discernible to the patron. Where there are wins on multiple lines, each winning payline shall be indicated in turn. This requirement would not apply to electro-mechanical reel games unless technology is used which implements the display of winning paylines in a manner similar to those found on video reel games. Additionally, this requirement shall not preclude other intuitive methods of displaying line wins such as the grouping of common win types, nor shall it prohibit a patron option to bypass a detailed outcome display of line wins, where supported.

5.4.4 Card Games.

The following requirements apply, as relevant to the specific game design, to games depicting cards being drawn from one or more card decks:

- a) At the start of each game and/or hand, the cards shall be drawn from a randomly-shuffled deck(s). It is acceptable to draw random numbers for replacement cards at the time of the first hand's random number draw, provided that the replacement cards are sequentially used as needed, and so long as any stored RNG values are encrypted;
- b) Cards once removed from the deck(s) shall not be returned to the deck(s) except as provided by the rules of the game;
- c) The deck(s) shall not be reshuffled except as provided by the rules of the game;

- d) The game shall alert the patron as to the number of cards in a deck and the number of decks in play;
- e) Card faces shall clearly display the card value and the suit; and
- f) Jokers and wild cards shall be distinguishable from all other cards.

5.4.5 Poker Games.

The following requirements apply, as relevant to the specific game design, to simulations of poker games:

- a) The artwork shall provide clear indication of what variant of poker is being played and the rules that apply;
- b) Wild card rules shall be clearly explained in the help screens; and
- c) Held and non-held cards, including recommended holds where allowed, shall be clearly marked on the screen. The method for changing a selected card state shall be clearly displayed to the patron.

5.4.6 Blackjack Games.

The following requirements apply, as relevant to the specific game design, to simulations of blackjack games:

- a) Insurance rules shall be clearly explained, if insurance is available;
- b) Pair split rules shall be explained to include:
 - i. Split aces have only one card dealt to each ace, if this is the game rule;
 - ii. Further splits, if available; and
 - iii. Double-down after splits, if available.
- c) Double-down rules shall be clearly explained, including limitations of which totals may allow a double-down to be selected;
- d) Any limits on the number of cards that may be drawn by patron and/or dealer shall

be explained, including winners declared (if any) when the limit is reached (e.g., five under wins);

- e) Surrender rules, if any, shall be explained;
- f) If pair splits have occurred, the results for each hand shall be shown (e.g., total points, resultant win or loss category, amount won, amount wagered);
- g) Special rules, if any, shall be clearly explained; and
- h) All patron options that are available at any point in time shall be shown in the artwork.

5.4.7 Roulette Games.

The following requirements apply, as relevant to the specific game design, to simulations of roulette games:

- a) The method of selecting individual wagers shall be explained by the game rules;
- b) The wager(s) already selected by the patron shall be displayed on the screen; and
- c) The result of each spin of the roulette wheel shall be clearly shown to the patron.

5.4.8 Dice Games.

The following requirements apply, as relevant to the specific game design, to simulations of dice games:

- a) Each die face shall clearly show the number of spots or other indication of the face value;
- b) It must be obvious which is the up face on each die, after the dice are thrown; and
- c) The result of each die shall be clearly visible or displayed.

5.4.9 Sports/Racing Game Requirements.

The following requirements apply, as relevant to the specific game design, to simulations of sports or racing games:

- a) Each participant in a race shall be unique in appearance, where applicable to the wager;
- b) The result of a game shall be clear and not open to misinterpretation by the patron;
- c) If awards are to be paid for combinations involving participants other than solely the first-place finisher, the order of the participants that can be involved with these awards shall be clearly shown on the screen (e.g., result 8-4-7); and
- d) The rules for any exotic wagering options (e.g.; perfecta, trifecta, quinella, etc.), and the expected payouts, shall be clearly explained in the artwork.

5.4.10 Ball Drawing Games.

The following requirements apply, as relevant to the specific game design, to games depicting balls or numbers being drawn from a pool:

- a) Simulated balls shall be drawn from a randomly mixed pool consisting of the full set of balls applicable to the game rules;
- b) At the start of each game, only the balls applicable to the game are to be depicted. For games with bonus features and additional balls that are selected, they shall be chosen from the original selection unless otherwise allowed for by the game rules;
- c) The pool shall not be re-mixed except as provided by the rules of the game depicted; and
- d) All balls drawn shall be clearly displayed to the patron.

5.4.11 Keno / Bingo / Lottery Games.

The following requirements apply, as relevant to the specific game design, for simulations of keno, bingo, or lottery games, where balls or numbers are drawn and a patron tries to pick in advance which of the balls or numbers will be selected:

- a) All of the patron's selections shall be clearly identified directly on the game screen. Where the game uses multiple patron cards, it is acceptable for the patron's selections to be accessible by flipping or switching through the cards;
- b) The drawn numbers shall be clearly identified on the screen;
- c) The game shall highlight numbers drawn which match the patron's selections;
- d) Special hits, if any, shall be clearly identified;
- e) The screen must provide clear indication of how many spots were selected and how many hits were achieved; and
- f) Rules for purchase of additional features of the game, if any, must be explained.

5.4.12 Scratch Ticket Games.

The following requirements apply, as relevant to the specific game design, to simulations of scratch ticket games, where an electronic scratch ticket is purchased by the patron:

- a) Electronic scratch ticket games shall rely on randomness as opposed to patron skill;
- b) A precise definition of which patron choices are required to complete the game shall be shown on the artwork;
- c) For games that leverage popular real-life themes (cards, dice, etc.), but do not mirror actual game play and probabilities, a disclaimer shall be added to the artwork that states outcomes are not distributed with the probabilities that would typically be expected from this game; and
- d) After the patron purchases an electronic scratch ticket, the outcome and prize of the game shall be revealed to the patron. The patron may or may not have to interact with the electronic scratch ticket to reveal the win/loss results, as required by the Commission.

5.4.13 Multi-Patron Games.

The following requirements apply, as relevant to the specific game design, to multi-patron games:

- a) The multi-patron game shall be designed such that the actions of or results obtained by any one patron do not affect the outcome(s) of any other patron, unless otherwise denoted by the game rules; and
- b) There shall be a method provided by a multi-patron game for each patron to know when the next game will begin.

5.5 Game Outcome Using a Random Number Generator (RNG)

5.5.1 Game Outcome.

Pursuant to Regulation 30(3)(b), the gaming machine shall determine game outcome solely by the application of chance or a combination of the skill of the patron and chance.

5.5.2 RNG and Evaluation of Game Outcome.

The evaluation of game outcome using an RNG shall comply with the following rules:

- a) Where more than one RNG is used to determine different game outcomes, each RNG shall be separately evaluated; and
- b) Where each instance of an RNG is identical, but involves a different implementation within the game, each implementation shall be separately evaluated.

5.5.3 Game Selection Process.

Determination of events of chance that result in a monetary award shall not be influenced, affected, or controlled by anything other than the values selected by an approved RNG, in accordance with the following requirements:

- a) Pursuant to Regulation 30(7), all possible game outcomes shall be available upon the initiation of each play of a game upon which a patron commits a wager on a gaming machine;

- b) The game shall not modify or discard outcomes selected by the RNG due to adaptive behavior. Additionally, outcomes shall be used as directed by the rules of the game;
- c) After selection of the game outcome, the game shall not display a “near miss” where it makes a variable secondary decision which affects the result shown to the patron. For example, if the RNG chooses a losing outcome, the game shall not substitute a different losing outcome to show to the patron than that originally selected.
- d) Pursuant to Regulation 30(10)(a), a game shall not alter any function of the gaming machine based on the actual hold percentage;
- e) Except as provided for by the rules of the game, events of chance shall be independent and shall not correlate with any other events within the same game, or events within previous games:
 - i. A game shall not adjust the likelihood of a bonus occurring, based on the history of prizes obtained in previous games; and
 - ii. A game shall not adapt its theoretical return to the patron based on past payouts.
- f) Any associated equipment used in conjunction with a gaming machine shall not influence or modify the behaviors of the game’s RNG and/or random selection process, except as authorized, or intended by design.

5.6 Game Fairness

5.6.1 Game Fairness.

The following requirements shall apply to the fairness of the game:

- a) Games that are designed to give a patron the perception that they have control over the outcome of the game due to skill or dexterity, when they actually do not (i.e., the game outcome is random and the illusion of skill is for entertainment value only), shall fully disclose this fact within the game help screens;
- b) Games shall not include any hidden source code that can be leveraged by a patron to circumvent the rules of play and/or the intended behaviors of game design; this requirement shall not preclude reasonably identifiable “discovery features” offered by a game which are intentional from a design perspective, but which may be undocumented or unknown to the patron; and
- c) The final outcome of each game shall be displayed for a sufficient length of time that permits a patron a reasonable opportunity to verify the outcome of the game; this requirement shall not preclude an option for the patron to bypass the outcome display.

5.6.2 Simulation of Physical Objects.

Where a game incorporates a graphical representation or simulation of a physical object that is used to determine game outcome, the behaviors portrayed by the simulation must be consistent with the real-world object, unless otherwise denoted by the game rules. This requirement shall not apply to graphical representations or simulations that are utilized for entertainment purposes only. The following shall apply to the simulation:

- a) The probability of any event occurring in the simulation that affects the outcome of the game shall be analogous to the properties of the physical object;

- b) Where the game simulates multiple physical objects that would normally be expected to be independent of one another based on the rules of the game, each simulation must be independent of any other simulations; and
- c) Where the game simulates physical objects that have no memory of previous events, the behavior of the simulated objects must be independent of their previous behavior, so as to be non-adaptive and non-predictable, unless otherwise disclosed to the patron.

5.6.3 Physics Engine.

Games may utilize a “physics engine” which is specialized software that approximates or simulates a physical environment, including behaviors such as motion, gravity, speed, acceleration, inertia, trajectory, etc. A physics engine shall be designed to maintain consistent play behaviors and game play environment unless an indication is otherwise provided to the patron by the game artwork. A physics engine may utilize the random properties of an RNG to impact game outcome, in which case, the requirements found elsewhere in this standard under “Random Number Generator (RNG) Requirements” chapter shall apply.

NOTE: Implementations of a physics engine in a gaming machine will be evaluated on a case-by-case basis by the testing laboratory.

5.6.4 Live Game Correlation.

Pursuant to Regulation 30(8), For a gaming machine that is recognizable as a simulation of a live game such as poker, blackjack, roulette, etc., the mathematical probability of a symbol or other element appearing in a game outcome shall be equal to the mathematical probability of that symbol or element occurring in the live game. For example, the odds of getting any particular number in roulette where there is a single zero (0) and a double zero (00) on the wheel, shall be one (1) in thirty-eight (38); the odds of drawing a specific card or cards in poker shall be the same as in the live game.

5.6.5 Random Event Probability.

For games that incorporate a random event or an element of chance that affects the outcome, the mathematical probability of any chance event occurring for a paid game shall be constant, unless otherwise denoted by the game artwork.

5.6.6 Constant Rules and Probability.

Pursuant to Regulation 30(5) and 30(6), once a game is initiated by a patron, the mode of play and the rules of play for that game, including the probability and award of a game outcome, shall not be changed. In the event the mode of play and the rules of play for the game, including probability and award of a game outcome, change between games during a gaming session, notice of the change must be prominently displayed to the patron.

5.6.7 Use of Identifiers.

Pursuant to Regulation 30(11), a gaming machine may use an identifier to determine which games or game options are presented to or available for selection by a patron. "Identifier" means any specific and verifiable fact concerning a patron or group of patrons that is based upon objective criteria relating to the patron or group of patrons, including, but not limited to:

- a) The frequency, value or extent of any predefined commercial activity;
- b) Any subscription to or enrolment in particular services;
- c) The use of a particular technology concurrent with the playing of a gaming machine;
- d) The skill of the patron;
- e) The skill of the patron relative to the skill of any other patron participating in the same game;
- f) The degree of skill required by the game; or
- g) Any combination of (a) to (f), inclusive.

5.7 Game Payout Percentages, Odds, and Non-Cash Awards

5.7.1 Software Requirements for Percentage Payout.

Pursuant to Regulation 30(3)(a), each game shall theoretically payout a minimum of eighty-three percent (83%) during the expected lifetime of the game. Progressive jackpots, incrementing jackpots, incentive awards, merchandise, etc. shall not be included in the percentage payout if they are external to the game, unless required for operation.

- a) The minimum percentage requirement shall be met for all wagering configurations. If a game is continuously played at any single bet level, line configuration, etc. for the life of the game, the minimum percentage requirement shall be satisfied; and
- b) Games that may be affected by patron skill shall meet the minimum percentage requirement when using an optimal method of play that provides the greatest return to the patron over a period of continuous play.

5.7.2 Odds.

Pursuant to Regulation 30(10)(b), the game must not offer an advertised award with odds greater than one-hundred million (100m) to 1.

5.7.3 Linked Odds.

Pursuant to Regulation 30(9), Where several gaming machines are connected to the same payoff schedule:

- a) If the gaming machines are played using the same denomination, they shall have equivalent odds of winning the payoff schedule based, as applicable, on either or both of the combined influence of the attributes of chance and skill; and
- b) If the gaming machines are played using different denominations, they shall equalise the expected value of winning the payoff schedule on the various denominations by

setting the odds of winning the payoff schedule in proportion to the amount wagered, based, as applicable on either or both, the combined influence of the attributes of chance and skill, or by requiring the same wager to win the payoff schedule regardless of the denomination, and the method of equalizing the expected value of winning the payoff schedule shall be conspicuously displayed on each gaming machine connected to the payoff schedule. In this regulation, “equalize” means bring within a five percent (5%) tolerance for expected value and no more than a one percent (1%) tolerance on Return to Patron or payback.

5.7.4 Limitations on Awards.

Limitations on the prize amounts in lieu of merchandise, annuities, or payment plans shall be clearly explained to the patron on the game that is offering such a prize.

5.8 Bonus/Feature Games

5.8.1 Bonus/Feature Game Requirements.

Bonus/feature games shall meet the following requirements:

- a) A game which offers a bonus/feature game, other than those that occur randomly, shall display to the patron sufficient information to indicate the current status towards the triggering of the next bonus/feature game;
- b) If a bonus/feature game requires obtaining several achievements towards the activation of a feature, or the awarding of a bonus prize, the number of achievements needed to trigger the feature, or win the bonus prize, shall be indicated, along with the number collected at any point;
- c) If a bonus/feature game allows the patron to hold one or more reels/cards/symbols for the purpose of a respin or draw, then the held reels/cards/symbols must be clearly indicated and the method for changing holds shall be clearly explained to the patron;
- d) If a bonus/feature game is triggered after accruing a certain number of events/symbols or combination of events/symbols of a different kind over multiple games, the probability of obtaining like events/symbols shall not deteriorate as the bonus/feature game progresses, unless otherwise disclosed to the patron;
- e) The bonus/feature game shall make it clear to the patron that they are in a bonus or feature mode; and
- f) If a bonus/feature game consists of multiple events or spins, then a counter shall be maintained and displayed to the patron to indicate the number of spins initially awarded and the number of spins remaining during bonus play, or alternatively, the number of spins that have been played.

5.8.2 Patron Selection or Interaction in Bonus/Feature Games.

All gaming machines which offer a bonus/feature game which requires patron selection or interaction are prohibited from automatically making selections or initiating games or

features, unless the gaming machine meets one of the requirements listed below and explains the mechanism for automatic initiation or selection in the artwork:

- a) The patron is presented with a choice and specifically acknowledges their intent to have the gaming machine auto-initiate the bonus/feature game by means of a button press or other patron interaction;
- b) The bonus/feature game provides only one choice to the patron, (i.e., “press button to spin wheel”) In this case, the device may auto-initiate the bonus/feature game after a time out period of at least two (2) minutes; or
- c) The bonus/feature game is offered as part of community play that involves two or more patrons and where the delay of an offered selection or game initiation will directly impact the ability for other patrons to continue their bonus or extended feature. Prior to automatically making selections or initiating a community bonus or feature the patron must be made aware of the time remaining in which they must make their selection or initiate play.

5.8.3 Extra Credits Wagered During a Bonus/Feature Game.

If a bonus or feature game requires extra credits to be wagered, and all winnings are accumulated from the base game and the bonus or feature game to a temporary “win” meter, rather than directly to the credit meter, the game shall:

- a) Provide a means where winnings on the temporary meter can be wagered (i.e., add credits to the credit meter) to allow for instances where the patron has an insufficient credit meter balance to complete the bonus/feature, or allow the patron to add money to the credit meter;
- b) Transfer all credits on the temporary win meter to the credit meter upon completion of the bonus or feature game; and
- c) Provide the patron an opportunity not to participate.

5.9 External Device Bonus Games

5.9.1 External Device Bonus Game Requirements.

Gaming machine software that is supported by an external bonus device utilizing an independent RNG shall meet the following rules:

- a) If the external device is used to display a bonus feature to the patron, then the game or device shall display all relevant details of the bonus game including, when applicable, individual line wins, remaining free spins, multiplier values, bonus eligibility, bonus rules, bonus meters, and any other bonus detail not listed;
- b) Changes to any configuration settings for the external bonus device shall be performed only by a secure means that is inaccessible to the patron;
- c) In the case that a bonus feature is offered with a timed eligibility period, changes to configuration settings shall not be allowed while there is time remaining for bonus eligibility, or while a gaming machine is within a bonus feature;
- d) If communications are lost between the gaming machine and the external bonus device, or if the external device malfunctions, the game shall tilt, enter an unplayable state and display a suitable error condition which shall require operator intervention to clear;
- e) If an eligible gaming machine goes into an unplayable state once a bonus feature has been triggered, the patron shall be given an opportunity to complete the bonus feature once the game returns to a playable state, or be awarded a calculated prize equivalent to their participation in the bonus, provided such an equivalent prize calculation is clearly disclosed to the patron. Any tilt related to this error condition shall be cleared automatically or by a casino employee, as appropriate. All instances of this behavior will be reviewed by the testing laboratory to determine whether or not current technology is able to accommodate this requirement; and
- f) The entire bonus game sequence including all bonus feature information shall be recallable in history and/or available through a maintained log for at least the last ten (10) bonus games. The necessary recall information shall be stored in the external bonus device and/or gaming machine such that all information needed to completely and accurately reconstruct bonus game play is available. See also

related requirements under “Game History Recall” section within this equipment standard.

5.10 Double-Up / Gamble Features

5.10.1 Double-Up / Gamble Requirements.

The following requirements apply to games which offer some form of a double-up or gamble feature. Such games may use alternative terminology such as “Triple-Up” or “Take-or-Risk” to describe a double-up or gamble feature.

- a) All double-up / gamble feature instructions shall be fully disclosed in the game's artwork and must be accessible without committing to the feature;
- b) Entry to a double-up / gamble feature shall only occur upon completion of a winning base game;
- c) The patron shall have a choice as to whether or not they want to participate in the double-up / gamble feature;
- d) The double-up or gamble features shall have a theoretical return to the patron of one hundred percent (100%);
- e) The maximum number of double-ups / gambles available shall be clearly stated, or as a suitable alternative, the prize limit for double-up / gamble shall be disclosed to the patron;
- f) Only credits won on the primary game shall be available for wagering on a double-up / gamble feature, (i.e., it is not possible to wager any credits from the credit meter on double-up / gamble);
- g) When the double-up / gamble feature is discontinued automatically before reaching the maximum number of double-ups / gambles available, the reason shall be clearly stated;
- h) Any game conditions during which the double-up / gamble feature is not available shall be specified;
- i) If a double-up / gamble feature offers a choice of multipliers, it must be clear to the patron what the range of choices and payouts are; and
- j) If the patron selects a multiplier for double-up / gamble, it must be clearly stated on the screen which multiplier has been selected.

5.11 Residual Credit Removal Feature

5.11.1 Residual Credit Removal.

A residual credit removal feature is a patron-selectable option that allows for the removal of credits left on the machine when there is a credit balance less than that which can be cashed out by the patron using an available, configured payment device. If residual credits exist, the manufacturer may provide a residual credit removal feature, or return the gaming machine to normal game play (i.e., leave the residual credits on the patron's credit meter). The following rules shall apply to a residual credit removal feature when implemented:

- a) Residual credits wagered by the residual credit removal play shall be added to the Coin-In meter;
- b) If the residual credit removal play is won, the value of the win shall either:
 - i. Increment the patron's credit meter; or
 - ii. Be automatically dispensed, and the value of the credits added to the Coin-Out meter;
- c) If the residual credit removal play is lost, all residual credits are to be removed from the credit meter;
- d) If the residual credits are cashed out rather than wagered, the gaming machine shall update the relevant meters;
- e) The residual credit removal play feature shall return at least eighty-three percent (83%) to the patron over the life of the game;
- f) The patron's current options and/or choices for residual credit removal shall be clearly displayed;
- g) If the residual credit removal play offers the patron a choice to complete the game, the patron shall also be given the option of exiting the residual credit removal feature and returning to the previous game mode; and
- h) The last game recall shall either display the residual credit removal play result or contain sufficient information, including metering, to derive the result.

5.12 Mystery Awards

5.12.1 General Statement.

A mystery award is a prize paid by a gaming machine that is not associated with a specific payable combination.

5.12.2 Requirements for Mystery Awards.

It is acceptable for games to offer a mystery award, however, the game artwork must indicate the minimum and maximum amounts that the patron could potentially win. If the minimum amount that could potentially be awarded is zero, then it is not required to be explicitly displayed. If the value of the mystery prize depends on credits wagered, or any other factors, the conditions shall be clearly stated.

5.13 Multiple Games on the Gaming machine

5.13.1 General Statement.

A multi-game is defined as a game which can simultaneously be configured for use with multiple themes and/or multiple paytables.

5.13.2 Selection of Game for Display.

The following rules apply to the selection of a specific game within a multi-game:

- a) The methodology employed by a patron to select a particular game for play on a multi-game gaming machine shall be clearly explained to the patron on the device;
- b) The gaming machine shall clearly inform the patron of all games available for play;
- c) The patron shall at all times be made aware of which game has been selected for play and is being played;
- d) When multiple games are offered for play, the patron shall not be forced to play a game just by selecting a game title, unless the game screen clearly indicates the game selection is unchangeable. If not disclosed, the patron shall be able to return to the main menu or game chooser screen prior to committing a wager;
- e) It shall not be possible to select or start a new game before the current game cycle is completed and all relevant meters and game history have been updated, including features, double-up / gamble, and other options of the game, unless the action to start a new game terminates the current play in an orderly manner. This requirement is not intended to preclude or prohibit game designs that involve the simultaneous play of multiple games on a single gaming machine. However, in such a case, metering and applicable limits and lockups shall be enforced against each available game, as it is played, and all other requirements within this chapter shall continue to apply to these multiple game-in-play designs;
- f) The set of games or the payable(s) offered to the patron for selection can be changed only by a secure, certified method. This requirement shall not preclude the use of an identifier to alter a game or payable. The rules outlined in

“Configuration Settings” section of this document shall govern the NV memory clear requirements related to these types of changes. However, for games that keep the previous payable’s data in memory, an NV memory clear is not required; and

- g) No changes to the set of games, or to the payable(s) offered to the patron for selection, are permitted while there are credits on the patron’s credit meter, or while a game is in progress. However, specific protocol features are permitted which allow such changes to be made in a controlled fashion, as defined by the protocol. Similarly, identifiers may be used to make such changes, subject to applicable logging and patron disclosure requirements defined elsewhere in this standard.

5.14 Game Program Interruption and Resumption

5.14.1 Requirements for Game Interruption and Resumption.

After a program interruption, the game software shall recover to the state it was in immediately prior to the interruption occurring. Where no patron input is required to complete the game, it is acceptable for the game to return to a game completion state, provided the game history and all credit and accounting meters reflect a completed game.

5.14.2 Default Game Display.

The default game display immediately following an NV memory reset shall not correspond to the highest advertised award. The default game display upon entering game play mode from a main menu or game chooser screen, shall not correspond to the highest advertised award. This applies to the base game only and not to any secondary bonus features.

5.15 Taxation Reporting Limits for Games

5.15.1 Game Taxation Lockup Requirements.

If the award(s) from a single game cycle is in excess of any configured maximum win limit, that is defined/configured on the gaming machine, the device shall cease play, display an appropriate message, and require casino employee intervention to resolve patron payment. It is permissible to provide a mechanism to accrue winnings to a separate meter, however, this meter must not support any direct wagers. When the amount on the meter is collected by the patron, the gaming machine must still lock up as per the defined/configured limit.

5.16 Alternative Game Modes

5.16.1 Test/Diagnostic Mode.

Test/diagnostic mode (sometimes called demonstration or audit mode) allows a casino employee to view game play mechanics, perform payable tests, or execute other auditing and/or diagnostic functions supported by the machine. If the gaming machine supports a test/diagnostic mode, the following rules apply:

- a) Entry to test/diagnostic mode shall only be possible using a secure means that is not accessible to the patron;
- b) If the gaming machine is in a test/diagnostic mode, any test or diagnostic that incorporates credits entering or leaving the gaming machine shall be completed prior to the resumption of normal game play operation;
- c) If the device is in a test/diagnostic mode, the gaming machine shall clearly indicate that it is in this mode, not normal game play;
- d) When exiting from test/diagnostic mode, the game shall return to the original state it was in when the test/diagnostic mode was entered; and
- e) Any credits on the gaming machine that were accrued during the test/diagnostic mode shall be automatically cleared when the mode is exited.

5.16.2 Attract Mode.

Attract mode enables the gaming machine to advertise game play to a potential patron. If the gaming machine supports an attract mode, the following rules apply:

- a) A gaming machine shall only enter attract mode when in an idle state and with no credits on the device;
- b) Attract mode shall accurately reflect an available configuration for the game; and
- c) Attract mode shall terminate automatically when any door is opened, or when any patron input or credit acceptance device is activated.

5.16.3 Free Play Mode.

Free play mode allows a patron to participate in a game without placing a wager. If the gaming machine supports a free play mode, the following requirements apply:

- a) Free play games shall accurately represent the normal operation of a paid game. Games played in free play mode shall not mislead the patron about the likelihood of winning any prizes available in the wagered version of the game;
- b) Free play mode shall be prominently displayed as such so a patron knows at all times if/when this mode is active;
- c) Free play mode shall not increment the credit meter or any accounting or occurrence meters. Specific meters are permissible for this mode provided the meters clearly indicate as such;
- d) Free play mode shall be terminated whenever the patron opts to exit this mode, or when the free play game(s) are concluded; and
- e) When free play mode is exited, the game shall return to its previous state.

NOTE: Paid games which may be played with credits received from an incentive award are not considered free play games.

5.16.4 Autoplay Mode.

Autoplay mode allows a gaming machine to place wagers automatically without patron interaction, once a denomination, wager, and other play attributes have been selected by the patron. If the gaming machine supports an autoplay mode, the following rules apply:

- a) Autoplay shall be securely controlled using a jurisdictional program that either allows or disallows the feature, reflective of jurisdictional preference;
- b) Autoplay mode may allow the patron to choose the individual game wager, the number of autoplays, and/or the total amount to be wagered:

- i. All patron-defined thresholds shall remain in effect for the duration of autoplay;
 - ii. The gaming machine shall display the number of autoplays remaining or the number used, reflective of a patron-defined threshold; and
 - iii. Autoplay mode must end automatically and return to manual game play when patron-defined thresholds are reached.
- c) Autoplay mode must offer the patron an option to terminate the mode at the completion of a current game cycle, regardless of how many autoplay wagers they initially chose or how many remain; and
- d) If patron options are supported for autoplay mode, these options must default to the manual mode of game play.

5.17 Game History Recall

5.17.1 Number of Last Games Required.

Information on at least the last ten (10) games played on the gaming machine shall be retrievable using an external key-switch or other secure method that is not available to the patron.

5.17.2 Last Play Information Required.

Game recall shall consist of graphical, textual, or video content, or some combination of these options, so long as the full and accurate reconstruction of game outcome is possible. Game recall shall display the following information:

- a) Date and time stamp;
- b) The denomination played for the game, if a multi-denomination game type;
- c) The display associated with the final outcome of the game, either graphically or via a clear text description;
- d) The credit meter value at the start of play and/or at the end of play;
- e) Any non-wager purchase that occurs during the recorded game;
- f) Paytable identification, unless discernible from other screens or attendant menus;
- g) Total amount wagered;
- h) Total amount won;
- i) Total amount collected after the end of a game, unless discernible from other screens or attendant menus;
- j) The results of any patron choices involved in the game outcome;
- k) The results of any intermediate game phases, such as double up / gamble, residual credit removal, or bonus games; and
- l) If a progressive prize was won, an indication that the progressive was awarded.

NOTE: For “Last Play Information” stated above, it is allowable to display values in United States currency in place of credits.

5.17.3 Bonus Game Recall.

The ten (10) game recall shall reflect at least the last fifty (50) events of completed bonus games. If a bonus game consists of 'x number of events,' each with separate outcomes, each of the 'x events', up to fifty (50), shall be displayed with its corresponding outcome, regardless of whether the result was a win or loss.

5.18 Tournament Games

5.18.1 General Statement.

A tournament is an organized, measured event that permits a patron to engage in competitive play against other patrons. Tournament play may be in-revenue or out-of-revenue.

5.18.2 Gaming Machine Hardware for Tournaments.

Gaming machine hardware supporting tournament play shall comply with the “Machine Requirements” as set forth in this equipment standard. All gaming machines used in a single tournament shall utilize similar hardware and electronics to ensure each patron has the same chance of winning, unless otherwise disclosed.

5.18.3 Gaming Machine Software for Tournaments.

Each gaming machine may be equipped with a certified program, which allows for tournament mode play. All gaming machines used in a single tournament shall utilize similar software and game configuration settings to ensure each patron has the same chance of winning, unless otherwise disclosed. If tournament is a configurable option for the gaming machine, it shall be enabled by a regulator-approved and controlled method requiring operator intervention. The tournament option shall default to disabled.

5.18.4 Gaming Machine Displays for Tournaments.

The following requirements apply to information displays for a gaming machine that supports tournament play, and/or information regarding a tournament that is otherwise provided to patrons via external signage, forms, or brochures available at the casino:

- a) All conditions patrons must meet to qualify for entry into the tournament, and advancement through it, shall be disclosed;
- b) A message shall be prominently displayed on the gaming machine informing the patron that it is operating in a tournament mode;
- c) For time-based tournaments, a timer shall be displayed to patrons to indicate the remaining period of play. If a tournament is based on some extended duration of play, or is initiated or concluded based upon the occurrence of a specific event, then this information shall be disclosed to the patrons;
- d) Specific information pertaining to any single tournament shall be displayed to the patrons, including the available prizes or awards;
- e) For tournaments with multiple awards, the distribution of funds based on specific outcomes shall be disclosed; and
- f) At the conclusion of the tournament, the patron rankings shall be displayed and the winner(s) notified.

5.18.5 Out-of-Revenue Tournaments.

The following requirements apply to a gaming machine offering out-of-revenue tournament game play:

- a) While enabled for out-of-revenue tournament play, the gaming machine shall not accept cash or currency from any source, nor shall the device issue payment; all credit acceptance devices shall be disabled. The gaming machine shall utilize tournament-specific credits, points, or chips which shall have no cash value;

NOTE: Tournament vouchers may be generated by the device while in the out-of-revenue tournament mode to serve as evidence of a patron's achieved score or rank.

- b) A gaming machine shall not increment any accounting meters unless they are meters designed exclusively for use with tournament software. Additionally, the gaming machine shall not communicate any tournament-related accounting information to the electronic monitoring system, if applicable, unless the tournament data is stored in separate records in the system;

- c) If game history recall is utilized to record the outcome of tournament game play, this shall be clearly indicated within recall and any tournament recall data shall not overwrite any non-tournament game play recorded in game history; and
- d) The gaming machine shall not impact the return percentage for the game, as the “Game Payout Percentages” requirements of this standard are waived for out-of-revenue tournament games.

5.18.6 In-Revenue Tournaments.

The following requirements apply gaming machines supporting in-revenue tournament game play:

- a) While enabled for in-revenue tournament play, the gaming machine shall allow for cash or currency from any source to be present on the gaming machine, subject to the rules and related internal controls for conducting the tournament;
- b) In-revenue tournament games shall increment the appropriate gaming machine electronic meters during play. Additionally, the gaming machine shall communicate this accounting information to the electronic monitoring system, when such a compatible system and protocol is supported; and
- c) Game history recall shall be utilized to record the outcome of in-revenue tournament game play, and this shall be clearly indicated within recall. Any tournament recall data shall not overwrite any non-tournament game play recorded in game history.

5.18.7 Remotely-Initiated Tournaments.

The following requirements apply to gaming machines which support tournament play that is controlled remotely:

- a) The patron shall be provided with an option on whether or not to participate. If/when opting in, the patron must be able to complete their non-tournament game prior to entering the tournament mode of play, unless the gaming machine supports simultaneous tournament and non-tournament modes of play;

- b) If the gaming machine is in an error condition or handpay condition, that condition must be cleared prior to entering tournament mode;
- c) When exiting tournament mode, the gaming machine shall return to the original state it was in prior to entering the tournament mode;
- d) Any tournament-specific game meters displayed to the patron by the gaming machine shall be automatically cleared when the tournament mode is exited.

5.19 Games with Skill

5.19.1 General Statement.

A game with skill contains one or more elements in its design which can be leveraged by a patron to impact the return percentage. Skill means the human attributes of a patron such as knowledge, dexterity, visual recognition, logic, memory, reaction, strength, agility, athleticism, hand-to-eye coordination, numerical and/or lexical ability, or any other ability or expertise relevant to game play.

NOTE: This equipment standard is not intended to classify a game as a “skill game” or to serve as a legal basis for game classification within the context of skill. Such classifications will be subject to interpretation by the Commission.

5.19.2 Display for Games with Skill.

A game with skill shall conform to applicable display requirements found in related sections of this standard for “Game Information and Rules of Play”, “Information to be Displayed”, and “Game Fairness”. In addition, as per Regulation 30(4), any game incorporating an element of skill shall indicate prominently that the outcome of the game is affected by patron skill. This disclosure shall be prominently displayed on the gaming machine prior to committing a wager.

5.19.3 Peer-to-Peer (P2P) Advantage Feature.

A Peer-to-Peer (P2P) game with skill may contain a feature that allows a patron or patrons to gain an advantage over other patrons, provided that the gaming machine:

- a) Clearly describes to all patrons that the feature is available and the advantage it offers;
- b) Discloses the method for obtaining the feature, including any required wager; and

- c) Provides patrons with sufficient information to make an informed decision, prior to game play, as to whether or not to compete against another patron(s) who may possess such a feature.

5.19.4 Virtual Opponent.

Games with skill may offer a patron the opportunity to compete against a virtual opponent provided that the gaming machine:

- a) Clearly and prominently discloses when a virtual opponent is participating; and
- b) Prevents the virtual opponent from utilizing privileged information of the live patron upon which a decision is made, unless otherwise disclosed to the patron.

5.19.5 Actual Return Percentage for Games with Skill.

A game with skill shall support the ability for the Commission or casino operator to securely examine the actual return percentage on-demand, via a direct interface with the metering/accounting of the gaming machine, and/or via secure communications with an electronic monitoring system.

5.19.6 Patron Advice Features.

A game containing a skill element may support a feature that offers advice, hints, or suggestions to a patron. An illustrative example might be a trivia game that provides hints, clues, or other patron assistance in making a selection. A game with skill may support patron advice features provided that it conforms to the following requirements:

- a) The patron advice feature shall clearly describe to the patron that it is available and what options exist for selection;
- b) Any patron advice that is offered to the patron for purchase shall clearly disclose the cost and benefit;

- c) The patron advice shall not be misleading or inaccurate, and must reflect the rules of play for the game, while noting that the game rules may change as a function of the advice offered, providing any such changes are disclosed to the patron prior to acceptance of the advice;
- d) The game design shall prevent access to any “information store” such that data related to the skill element is not readily available through software tampering (for example, a trivia game shall prevent access to an answers database);
- e) The patron advice feature shall allow the patron the option of accepting the advice, and must not force the patron to accept the assistance unless it reflects the only possible option for the patron to pursue at the time; and
- f) The availability and content of patron advice shall remain consistent unless otherwise disclosed and must not adapt in a way that disadvantages the patron based upon prior game play or game events.

NOTE: It is recommended that the gaming machine support a secure option to enable or disable patron advice.

5.19.7 Peripheral Devices Used with Games Containing Skill.

If unique peripherals (e.g., joysticks, game controllers, camera systems, sound systems, motion sensors, image sensors, accelerometers, etc.) are employed by the gaming machine to support skill, then the game must provide adequate and clear instruction on their purpose, usage, and effect.

5.19.8 Game Recall for Games with Skill.

Games with skill shall maintain all information necessary to adequately reconstruct the last ten (10) gaming sessions, consistent with recall requirements stated within the section entitled “Last Play Information Required”. Some combination of text, logs, video, graphics, screen captures, or other means (e.g., “flight recorder” mechanism) shall be used to reconstruct the game outcome and/or patron actions, provided that game history recall is sufficient to reconstruct game play. Additionally, for any game with skill that offers patron advice, game recall shall reflect that information.

5.19.9 Interruption and Resumption for Games with Skill.

After a program interruption, a game with skill shall recover to the state it was in before the interruption, unless the game artwork clearly discloses any superseding terms and conditions for game recovery. This disclosure must be available to the patron prior to play of the game.

5.20 Persistence Games

5.20.1 General Statement.

A persistence game is associated with a unique attribute (e.g., patron ID, game or device ID, etc.) and incorporates a feature that enables progress towards the award of game play enhancements and/or bonuses through the achievement of some designated game outcome. These additional offerings become available when the patron has achieved specific thresholds defined for game play. Each designated outcome advances the state of the persistence game. Multiple plays of a game are usually necessary to trigger the persistence award. The persistence feature is typically provided through a persistence game controller associated with a single gaming machine, bank of devices, or linked system.

5.20.2 Persistence Game Thresholds.

A persistence game shall recognize a particular attribute for the purpose of restoring previously-earned thresholds during each subsequent visit to a gaming machine. A gaming machine participating in a persistence game shall contain in its help screens, a clear description of each persistence game-related feature and/or function, and the requirements for achieving persistence game thresholds, as well as information regarding how the patron restores previously-earned thresholds (using a login/password, ticket, etc.). Additionally, patrons shall be notified each time a persistence game threshold has been achieved.

5.20.3 Play from Save.

Play from save is a feature utilized in some persistence game designs where complexity increases, or additional elements are added to the game, as play continues. Additionally, play from save allows the patron to save a persistence game at critical points (i.e., save points), typically after some accomplishment or goal has been achieved. The patron can resume game play from that point at a later date and continue on to the next goal. The following requirements apply to play from save:

- a) Prizes awarded or made available for reaching a save point shall be clearly defined and displayed to the patron prior to placing any wager. If a random type award may be won, the details and all possible payouts shall be displayed to the patron;
- b) The game shall provide a suitable notification to the patron whenever a designated save point is reached during play;
- c) If game rules or awards change as different levels are reached during play from save activity, these changes must be clearly displayed to the patron; and
- d) If the play from save state is not indefinitely maintained, then the game shall provide an indication to the patron of any limitation and/or expiration of saved data that is stored for use in supporting game play at a later period in time.

5.20.4 Loss of Communications or Malfunction.

The gaming machine shall adhere to the following requirements for a loss of communication or critical controller malfunction during persistence game play:

- a) For cases where the persistence game controller stores critical data, a gaming machine shall tilt and become unplayable when there is a loss of communication with the persistence game controller, or if there is a critical controller malfunction. The gaming machine must inform the patron if persistence game play is disabled. For cases where the persistence game controller does not store any critical data and there is a loss of communication or controller malfunction, the gaming machine shall continue operation but must still inform the patron if persistence game play has been disabled;
- b) A gaming machine shall resume the persistence game play from the point of interruption when the communication is restored, or the controller malfunction is cleared; or
- c) A gaming machine shall allow persistence game play to continue if the controller communicates the award thresholds to the device prior to the communication loss or controller malfunction; the gaming machine may continue operating if it is capable of determining the trigger for the persistence award while operating independently. The gaming machine shall clearly notify the patron when it is operating independently.

5.21 Community Bonus Games

5.21.1 General Statement.

Gaming machines may support community bonuses where a bank of machines is connected to a controller that allows patrons to collaborate and/or compete for a shared prize.

5.21.2 Community Bonuses.

The following requirements apply for gaming machines which support community bonuses:

- a) The artwork shall contain an appropriate description of the rules governing each community bonus, each payout and any conditions regarding patron eligibility for the community bonus award(s);
- b) The gaming machine shall continuously and conspicuously display the patron's eligibility for a community bonus, regardless of the number of credits on the game. For example, if the patron has thirty seconds of eligibility time remaining but has run out of credits, the game will continue to display and count down the seconds remaining; and
- c) When a gaming machine offers a community bonus that is not dependent on the number of credits available, the gaming machine shall alert the patron of his continued eligibility regardless of whether the patron has credits remaining on the gaming machine.

5.21.3 Community Bonus Game Controller Error.

When an error occurs that impacts the integrity of play on the community bonus game controller, all participating gaming machines shall be disabled, or alternatively, the gaming machine shall provide the patrons the option of waiting for the error to be cleared, or to forego the community bonus by providing another non-community bonus game for play

that affords a comparable return percentage. A clear and unambiguous error or tilt message that explains the stoppage of game play and error handling shall be displayed on each of the interconnected gaming machines and/or any overhead or shared display, as applicable to the implementation. This error or tilt message will activate the device alert mechanism or flash lights and shall be communicated to the electronic monitoring system, when such a compatible system and protocol is supported, and shall not be cleared automatically.

5.21.4 Loss of Communications.

The gaming machine shall adhere to the following requirements for a loss of communications during community bonus game play:

- a) A gaming machine connected to a community bonus game controller shall tilt and become unplayable when there is a loss of communication between the gaming machine and the controller. The gaming machine must inform the patron if community bonus game play is disabled. This error or tilt message will activate the device alert mechanism or flash lights and shall be communicated to the electronic monitoring system, when such a compatible system and protocol is supported, and shall not be cleared automatically;
- b) A gaming machine shall resume the community bonus game play from the point of interruption when the communications have been restored; and
- c) A gaming machine shall allow community bonus game play to continue if the controller communicates the award to the gaming machine prior to the communication loss. The gaming machine may continue operating if it is capable of functioning independently. The gaming machine shall clearly notify the patron when it is operating independently.

5.21.5 Community Bonus Event Recall.

Outcomes for at least the last ten (10) community bonus events shall be recallable in game history and/or available through a maintained recall log. The necessary recall information shall be stored in the gaming machine and/or in the community bonus

controller. See also related requirements found under the “Game History Recall” section within this equipment standard.

5.22 Progressive Jackpots and Incrementing Jackpots

5.22.1 General Statement.

This section applies to monetary jackpot awards or “payoffs” which increase based on game play as follows:

- a) Progressive jackpots awards increase according to the credits wagered in the game; and
- b) Incrementing jackpots awards behave identically as progressive jackpots, except they increase based on the occurrence of one or more specific conditions (defined events) established by the rules of the game instead of, or in addition to, increases based on credits wagered.

NOTE: This section does not apply to awards of restrictive incentive credits, fixed awards or bonus prizes, bonuses/features which offer awards which may increase over a single game cycle or, static awards whose probabilities of triggering change as the game is played. This section also does not apply to persistence game features which increase as the game is played (e.g., number of free games, multipliers, several achievements towards the activation of a bonus/feature or the issuance of an award, etc.) or “levels” of static awards available to be won based on patron experience and/or achievements.

5.22.2 Jackpot Display.

The jackpot display is a mechanical, electrical, or electronic device, including the video display incorporated into the gaming machine or an external display, which is used to indicate the current jackpot award amount or “payoff” for each jackpot in credits or the United States currency format to all patrons who are playing a game which may potentially trigger the jackpot. If the jackpot offers a “mystery payoff” where the actual payoff is not displayed to the patron, the “Mystery Award Features” shall apply.

- a) As games are played, the current payoff for each jackpot shall be updated on the jackpot display at least every thirty (30);
- b) seconds from the incrementing game event to reasonably reflect the actual size of the payoff. The use of odometer and other “paced” updating displays are allowed; and
- c) Where the jackpot display has a maximum display limitation (i.e., it could only display a certain number of digits), a maximum payoff limit or “ceiling” shall be required and shall meet the requirements for “Maximum Payoff Limits”.

NOTE: The payoff(s) shall be displayed as accurately as possible within the constraints of communication delays and latencies.

5.22.3 Maximum Payoff Limits.

If a maximum payoff limit or “ceiling” is supported by the jackpot, once the payoff reaches its ceiling, it shall remain at that value until awarded to a patron.

- a) All additional contributions shall be credited to an overflow or diversion pool; and
- b) Where disclosed to the patron in the artwork, the displayed ceiling amount shall be accurate.

NOTE: If not displayed directly by the artwork, it is the responsibility of the operator to provide the ceiling amount to players via stickers, decals, external signage, forms, or brochures available at the casino where required by the Commission.

5.22.4 Jackpot Diversion.

Where allowed by the Commission, a Jackpot Diversion Scheme may be used, where a portion of the jackpot contributions are diverted to another pool or “diversion pool” to be used as needed by the design of the jackpot (e.g., the diversion pool may be added to the reset value of the next jackpot or be used to pay simultaneous wins of a jackpot).

- a) A Jackpot Diversion Scheme shall be able to be implemented such that it does not have a mathematical expectation of infinity;
- b) Diversion pools shall not be truncated. Diverted contributions once that diversion pool has reached its upper limit shall be accounted for; and
- c) Where a diversion pool is used to fund the reset value of a jackpot, the reset value shall assume an empty diversion pool for the purposes of RTP calculations.

5.22.5 Jackpot Wins.

Jackpots may be awarded based on obtaining winning symbols, or by other criteria, such as mystery-triggered jackpots, bad-beat jackpots, etc. When a jackpot is triggered:

- a) A winning patron shall be notified of a jackpot win, and its payoff, by the end of the game in play;
- b) Contributions toward the jackpot shall not be lost. Jackpot payoffs when awarded shall not be rounded down or truncated unless carried over to the reset amount;
- c) When in use, the jackpot payoff may be added to the patron's credit meter if either:
 - i. The credit meter is maintained in the United States currency amount format;
 - ii. The jackpot payoff is incremented in whole credit amounts; or
 - iii. The jackpot payoff in United States currency amount format is converted properly to credits upon transfer to the credit meter in a manner that does not mislead the patron.
- d) The jackpot payoff shall update to the reset value and continue normal operations.

NOTE: A jackpot may be disabled or decommissioned concurrent with the winning of the jackpot if the game was configured to automatically disable or establish in its place an award which does not increment.

5.22.6 Swapping Jackpot Levels.

For jackpots offering multiple levels of awards, when a single winning combination may be evaluated as more than one of the available payable combinations, unless otherwise explicitly defined in the game rules, the patron shall always be paid the highest possible value based on all combinations to which the outcome may correlate (e.g., if “Jackpot A” is awarded for five aces on a payline and “Jackpot B” is awarded for four aces on a payline, and “Jackpot B” has a larger award than “Jackpot A”, the patron shall be awarded the payoff for “Jackpot B” if the patron obtains an outcome of five (5) aces on a payline).

5.22.7 Mystery-Triggered Jackpots.

For mystery-triggered jackpots which use a hidden trigger amount to determine the when the jackpot is awarded:

- a) The hidden trigger amount shall be set randomly upon each jackpot reset and shall remain unknown at all times; and
- b) It shall not be possible to gain access to or knowledge of the hidden trigger amount at any time.

5.22.8 Jackpot Triggers for Multiple Patrons.

The control programme software shall be designed to accurately identify and record the order of triggers when multiple patrons trigger at nearly the same time, such that the full amount of the displayed payoff can be awarded to winning patron who triggered first. When this is not possible or if it's possible that multiple patrons trigger at the exact same time (e.g., in a multi-patron game), one of the following shall occur:

- a) The full amount of the displayed payoff shall be awarded to each winning patron;
or
- b) Accurate information on how the payoff is distributed shall be disclosed to the patron.

NOTE: If not displayed directly by the artwork, it is the responsibility of the operator to provide how the payoff is distributed to players via stickers, decals, external signage, forms, or brochures available at the casino where required by the Commission.

5.22.9 Internal Linked Jackpot Controllers.

Where the control programme software acts as linked jackpot controller (i.e. internal linked jackpot controller), only gaming machine on the link at a time shall function as the primary jackpot controller. If the gaming machine configured as the primary jackpot controller becomes inoperative the linked jackpot(s) shall be disabled and the requirements specified in the "Jackpot Disable" section of this document shall be met unless another gaming machine has been immediately established as the primary jackpot controller.

5.2210 Jackpot Disable.

For cases where a progressive jackpot or incrementing jackpot is disabled (e.g., operator intervention, error condition, time limit has expired, etc.), the following requirements shall apply:

- a) An indication shall be displayed when the jackpot is not available;
- b) It shall not be possible for the jackpot to be incremented or won while in this state;
and
- c) Upon resumption of the jackpot from the disabled state, it shall be possible to return the jackpot with the identical parameters as before the disable, including the payoff. The hidden trigger amount, if used to determine jackpot win for a mystery-triggered jackpot, may only be reselected if the reselected amount is in the range of the current payoff to the ceiling.

5.23 Virtual Event Wagering

5.23.1 General Statement.

Virtual event wagering allows for the placement of wagers on simulations of sporting events, contests, and races whose results are based solely on the output of an approved Random Number Generator (RNG) as approved by the Commission. The following requirements are only applicable to cases that virtual event wagering is conducted by a gaming machine (e.g., patron makes a wager and the event plays out before them on their machine or a shared display on a multi-patron machine). For virtual events conducted in total by the Computerized Betting System where a wager is placed at a Wagering Device or through interaction with an attendant and then the virtual event is displayed via a public or common display (e.g. external display, website, etc.), please refer to any relevant requirements.

5.23.2 Randomization and Virtual Events.

The RNG utilized in virtual event wagering shall comply with applicable requirements as found within the “Random Number Generator (RNG) Requirements” chapter and “Game Outcome Using a Random Number Generator” section of this equipment standard. Additionally, the following rules apply specific to virtual event wagering:

- a) It shall not be possible to ascertain the outcome of the virtual event prior to its commencement; and
- b) After the commencement of a virtual event, no subsequent actions or decisions may be made that change the behavior of any of the elements of chance within the virtual event, other than patron decisions.

5.23.3 Virtual Event Rules and Information.

Comprehensive rules and information shall be posted on the gaming machine regarding the virtual events and markets available for wagering. The following information shall be made available without the need for placing a wager.

- a) Rules of participation, including all wagering eligibility and scoring criteria, available virtual events and markets, types of wagers accepted, line postings, all advertised awards, and the effect of schedule changes;
- b) Current odds/payouts and prices for available markets;
- c) Payout information, including possible winning positions, rankings, and achievements, along with their corresponding payouts, for any available wager option;
- d) Whether the odds/payouts are locked-in at the time of the wager, or if the odds/payouts may change dynamically prior to the commencement of the event and the method of noticing changes to the odds/payouts;
- e) For types of wagers where the odds/payouts are fixed at the time the wager is placed, any situations where the odds/payouts may be adjusted such as atypical winning outcomes (e.g., dead heats), cancelled legs of wagers with multiple events (e.g., parlay wagers), and prorating;
- f) For types of markets where individual wagers are gathered into pools:
 - i. Up-to-date odds/payouts information for simple market pools. For complex market pools, it is accepted that there may be reasonable limitations to the up-to-date accuracy of the pool estimates displayed to the patron;
 - ii. Up-to-date values of total investments for all market pools; and
 - iii. The dividends of any decided market and the rules for dividend calculation including the prevailing formula for pool allocations and the stipulations of the event being wagered upon as approved by the Commission.
- g) How a winning wager is determined and the handling of an award in any case where a tie is possible;
- h) The payment of winning wagers, including the redemption period and the method for calculation. Where the calculation of payouts may involve rounding, information on how these circumstances are handled shall clearly explain:
 - i. Rounding up, down (truncation), true rounding; and
 - ii. Rounding to what level (e.g., 5 cents).

5.23.4 Virtual Wager Placement.

The following rules apply to the placement of a virtual wager:

- a) The method of placing a wager shall be straightforward, with all selections (including their order, if relevant) identified. When the wager involves multiple events (e.g., parlay wagers), such groupings shall be identified.
- b) Patrons shall have the ability to select the market they want to place a wager on.
- c) Patrons shall have an opportunity to review and confirm their selections before the wager is submitted.
- d) Clear indication shall be provided that a wager has been accepted or rejected (in full or in part). Each wager shall be acknowledged and clearly indicated separately so that there is no doubt as to which wagers have been accepted.

5.23.5 Virtual Event Display.

Displays for a virtual event shall conform to applicable display requirements of this standard as found in the sections entitled “Game Information and Rules of Play”, “Information to be Displayed”, and “Game Fairness”. In addition, the following display requirements apply:

- a) Statistical data that is made available to the patron pertaining to the virtual event shall not misrepresent the capabilities of any virtual participant. This does not prevent the use of an element of chance or randomness from impacting performance of the virtual participant during the virtual event game;
- b) For scheduled virtual events, a countdown of the time remaining to place a wager in that event shall be displayed to the patron. It shall not be possible to place wagers on the event once this time has passed, however, this requirement does not prohibit the implementation of in-play wagers;
- c) Each virtual participant shall be unique in appearance, where applicable to the wager. For instance, if the wager is on one team to beat another, the virtual participants themselves do not need to be unique in appearance, however the teams that they are on shall be visually distinct from each other; and

- d) The result of a virtual event shall be clear, unambiguous, and displayed for a sufficient length of time to allow a patron a reasonable opportunity to verify the virtual event's outcome.

GLOSSARY OF KEY TERMS

Advertised Award – An award that can be awarded by a game and which is explicitly advertised to the patron in the game artwork.

Alarm – An audible alert provided by a gaming machine that can be heard in a typical operating environment and which is intended to notify responsible personnel to various error conditions that may exist for the device.

Algorithm – A finite set of unambiguous instructions performed in a prescribed sequence to achieve a goal, especially a mathematical rule or procedure used to compute a desired result. Algorithms are the basis for most computer programming.

Alterable Media – Physical storage media for control programmes that can be altered or modified when installed and operating in-circuit within the gaming machine. From a practical standpoint, media that is rendered read-only or unalterable by a hardware or software means when installed and operating is not considered alterable media.

Alternative Game Mode – Any mode of gaming other than the normal mode of game play. This includes modes such as attract, test/diagnostic, autoplay, idle, and free play.

Artwork – The graphics, thematic art, helpscreens, and other textual information that is shown to a patron by way of a game's payglass and/or video display(s).

Attendant Paid Cancelled Credits – Credit value paid by a casino employee resulting from a patron-initiated cash-out that exceeds the physical or configured capability of the device.

Attendant Paid Jackpot – Credit value paid by a casino employee resulting from a single game cycle, the amount of which is not capable of being paid automatically by the gaming machine itself.

Attract Mode – Visual and/or audible options intended to attract patrons when the machine is in the idle mode (i.e., no active credits or gameplay).

Autoplay Mode – A patron-selectable mode of a gaming machine that allows a patron to place wagers automatically without any manual interaction, once a denomination, wager, and other play attributes have been selected for game play.

Background Cycling (for RNG) – A process whereby an RNG continues to generate random numbers at a programmed rate during periods where its output is not actively being used to produce game outcomes.

Barcode – An optical machine-readable representation of data. A good example is a barcode found on printed wagering instruments.

Barcode Reader – A device that is capable of reading or interpreting a barcode. This may extend to some smartphones or other electronic devices that can execute an application to read a barcode.

Bill Validator – A peripheral that accepts paper currency, wagering instruments, and other approved items in exchange for credits.

Biometrics – A biological identification input, such as fingerprints or retina patterns.

Bonusing Award – An incentive award based on a game event or some external trigger which do not include triggers based upon specific patron account activity. Examples include multiplied awards, whereby the game multiplies all wins within a specified range by a specified value or an nth coin award is won when a percentage of play on participating games reaches a randomly selected value.

Card Reader – A peripheral that reads data embedded on a magnetic strip, or stored in an integrated circuit chip, for the purpose of patron identification.

Cashable Credits (aka “Unrestricted Credits”) – Credits that are redeemable for cash.

Cashable Promotional Credit Wagered – The total value of promotional cashable credits which are wagered.

Cashless Wagering System – An electronic system that allows a gaming operator to offer its patrons a way of placing stakes and receiving winnings, without using cash or chips, by means of direct debiting and crediting of the patron account.

Casino – Any premises, or part of premises, within a designated site where persons may participate in one or more games approved by the Commission.

Casino Employee – An employee having functions in or in relation to a casino.

Casino Operator – A person who is the holder of a casino licence.

CEP, Cashable Electronic Promotion – Cashable credits electronically transferred to/from a gaming machine from/to a patron account.

CFast, CompactFast – A variant of a Compact Flash based on a serial ATA interface rather than the parallel ATA used by CF Cards.

CF Card, Compact Flash – A small removable mass storage device that relies on flash memory technology. A CF card is a storage technology that does not require a battery to retain data indefinitely.

Collect Meter – A meter which shows the number of credits or cash collected by a patron upon cashout.

Community Bonus – A type of bonus/feature play where patrons collaborate and/or compete for a shared award.

Commission – The Bermuda Gaming Commission

Contributions – The financial method by which progressive jackpot or incrementing jackpot pools are funded.

Control Programme Software – A software program that controls gaming machine behaviors and affects the result of a wager by determining win or loss. Control programme software includes any software, source language or executable code associated with a random number generation process; the mapping of random numbers to game elements to determine game outcome; the evaluation of randomly selected game elements to determine win or loss; payment of winning wagers; game recall; game accounting including the communication of meter and log information to a metering host system; monetary transactions conducted through an electronic monitoring system; software verification and authentication functions that are specifically designed and intended for use in a gaming machine; monitoring and generation of game tilts or error conditions; and game operating systems that are specifically designed and intended for use in a gaming machine. Control programme software does not include software associated with the graphics, sound, animation or other such artistic attributes of a game that is used to provide entertainment that is not material to the game;

Coupon – A printed or virtual wagering instrument that is used primarily for promotional purposes and which can be redeemed for restricted or unrestricted credits.

Coupon Promotion In/Out – The total value of all coupons accepted or paid out by the gaming machine.

CPU, Central Processing Unit – An electronic component of a gaming machine, more commonly called the processor, which consists of a control unit and arithmetic logic unit and which is located on a circuit board housed within the secure logic area of the gaming machine. The CPU performs arithmetic and logic functions and decodes and executes game program instructions.

CRC, Cyclic Redundancy Check – A software algorithm used to verify the accuracy of data during its transmission, storage, or retrieval. The algorithm is used to validate or check the data for possible corruption or unauthorized changes.

Critical Non-Volatile (NV) Memory – Memory used to store all data that is considered vital to the continued operation of the gaming machine including, but not limited to, data elements such as electronic accounting and metering, current credits, configuration data, game recall, significant events, last normal game and machine state, payable information, etc.

Cryptographic RNG – A Random Number Generator (RNG) which is resistant to attack or compromise by an intelligent attacker with modern computational resources who has knowledge of the source code of the RNG and/or its algorithm. Cryptographic RNGs cannot be feasibly 'broken' to predict future values.

Debit Instrument – A card, code, or other device with which a person may initiate an electronic funds transfer. The term includes, without limitation, a prepaid access instrument.

Direct Cryptanalytic Attack – An RNG attack whereby the attacker, given a sequence of past values produced by an RNG, is able to predict or estimate future RNG values.

Diversion Pool – The monies collected pursuant to a contribution schedule that are intended to be used for the funding of future progressive jackpots and incrementing jackpots or for other purposes.

Double-Up (aka "Gamble") – An extended game play feature available to a patron to double or risk current winnings.

Electronic Accounting Meter (aka "Software Meter" / "Soft Meter") – An accounting meter that is implemented in the main program software of a gaming machine.

EFT, *Electronic Funds Transfer*; ECT, *Electronic Credits Transfer* – A system by which currency can be electronically transferred to or from a gaming machine in the form of credits. EFT requires some form of communication between the gaming machine and a host system.

Electronic Monitoring System – Any electronic or computer or communications system or device that is so designed that it may be used, or adapted, to send or receive data from gaming equipment in relation to the security, accounting or operation of gaming equipment;

Electronic Table Game – A gaming machine used for the purpose of playing a game traditionally played at tables and includes any electronic device through which bets may be placed on a game played at a table.

EMC, *Electromagnetic Compatibility* – The principal in which any electronic or electrical appliance should be able to operate without causing, or being affected by, electromagnetic interference.

EMI, *Electromagnetic Interference* – Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment.

EPROM, *Erasable Programmable Read-Only Memory* – A memory chip that holds its content without power and can be erased using ultraviolet light, or reprogrammed external to the gaming machine using a special tool.

ESD, *Electro-Static Discharge* – The release of static electricity when two objects come into contact. It is the sudden flow of electricity between two electrically charged objects caused by contact, an electrical short, or a dielectric breakdown.

Firewall – A component of a computer system or network that is designed to block unauthorized access or traffic while still permitting outward communication.

Firmware – Programs stored permanently in read-only memory (ROM).

Flight Recorder – Game recall functionality that records various patron physical actions and correlates them in time to other game inputs such as touch screen activations, button presses, etc. in order to more fully reconstruct the outcome of game play. When used in conjunction with a game containing a physical skill element, such functionality may be especially useful for recording/documenting aspects of game history specific to a patron’s physicality, dexterity, motions, or gestures.

Free Play Mode – A gaming machine mode that allows a patron to participate in a game without placing any wager, principally for the purpose of learning or understanding game play mechanics.

Game – a) a game that is, or is purported to be, a game of chance or a game of chance and skill combined; or b) a scheme, method or device that – (i) may be used to allot or distribute prizes by lot or chance amongst a group of participants; or (ii) is prescribed as a game for the purposes of this definition;

Game Cycle – The period from an initial wager to the point of the final transfer to the patron’s credit meter, or when all credits wagered are lost. A game cycle is defined as “wager to wager”.

Game Device - means specific components within the machines.

Game Outcome – The final result of the wager.

Game Theme (aka “Personality Program”) – The concept, subject matter, and methodology of design in which a game is built around, including artwork, game graphics, one or more paytables, sound effects, and music.

Game with Skill – A wagered game in which the skill of the patron, rather than pure chance, is a factor in affecting the outcome of the game as determined over a period of

continuous play. A game with skill contains one or more elements of skill in its design which can be leveraged by a patron to impact the return percentage.

Gaming Equipment – An electronic, electrical, or mechanical contrivance or machine or any device or thing (including chips) used, or capable of being used, for or in connection with gaming and betting and includes any of the following a gaming machine; linked jackpot equipment or system; cashless wagering system; an electronic monitoring system; and a part of, or a replacement part for, any such machine, equipment or system; devices used in connection with the operation of table games, including but not limited to playing cards, chips and dice; a computerised betting system.

Gaming Machine (aka, machine, terminal) – Any device, whether wholly or partly mechanically or electronically operated, that is so designed that it may be used for the purpose of playing a game of chance or a game of mixed chance and skill, and as a result of making a wager on the device, winnings may become payable. At a minimum, a gaming machine contains some form of activation to initiate the selection process, and makes use of a suitable methodology for delivery of the determined outcome.

Gaming Session – The period of time that begins when a patron initiates a game or series of games on a gaming machine by placing a wager and ends at the time of a final game outcome for that game or series of games.

Hardware-Based RNG – An RNG that derives its randomness from small-scale physical events such as electric circuit feedback, thermal noise, radioactive decay, photon spin, etc.

Hash Algorithm – A function that converts a data string into a numeric string output of fixed length.

Identifier – Any specific and verifiable fact concerning a patron or group of patrons which is based upon objective criteria relating to the patron or group of patrons and which may be utilized to affect some prescribed change to a game or gaming machine configuration.

Idle Mode – A gaming machine mode that exists when the machine is not being played and no credits exist on the credit meter.

In-Play Wager – A wager that is placed while a virtual event is in-progress or actually taking place.

Incentive Credits and/or Prizes (aka “Incentive Awards”) – Credits and/or prizes that are not described in the payable of a game, that is based upon predetermined events or criteria established by the parameters of a system. An incentive award may be a promotional award or a bonusing award.

Increment Rate – The configurable or hardcoded value used to increment the progressive jackpot or incrementing jackpot.

Incrementing Jackpot – A monetary award or “payoff” which increases on the occurrence of one or more specific conditions (defined events) established by the rules of the game. In addition to the defined event(s), it is acceptable for incrementing jackpots to also increase according to the credits wagered in the game. An example of this would be an incrementing jackpot which increases every time you get a specific win in a bonus.

Jackpot – The combination of letters, numbers, symbols or representations required to be displayed on the reels or video screen of a gaming machine so that the winnings in accordance with the prize payout scale displayed on the machine are payable from money which accumulates as contributions are made to a special prize pool.

Jackpot Display – A display which is used to indicate the progressive jackpot or incrementing jackpot information.

Jackpot Diversion Scheme – A portion of the jackpot contributions are diverted to another pool or “diversion pool” to be used as needed by the design of the progressive jackpot or incrementing jackpot (e.g., the diversion pool may be added to the reset value of the next jackpot or be used to pay simultaneous wins of a jackpot)

Jumper – A removable connector (plug, wire, etc.) that electrically joins together or short-circuits two separate physical connections.

Known Input Attack – An RNG attack whereby the attacker is able to compromise an RNG by determining or estimating the state of the RNG after initial seeding.

Linked Jackpot Equipment – Any jackpot meter, payout display, linking equipment, computer equipment, programming or other device (other than a gaming machine) forming, or capable of forming, part of a linked jackpot arrangement.

Logic Area / Logic Box – A separately locked area of a gaming machine which houses electronic components that have the potential to influence the outcome or integrity of the device. This area contains the main processor board and other critical components. It is a sealed, secured box or enclosure within the machine that houses the control programme(s) for the device.

Mapping Algorithm – An algorithm or method by which a value is associated to a symbol or object that is usable and applicable to the current game (e.g.: the value 51 might be mapped to an ace of spades).

Mechanical RNG (aka “Physical Randomness Device”) – An RNG that generates outcomes mechanically, employing the laws of physics. Gaming machine implementations include, but are not limited to, mechanical wheels, tumblers, blowers, shufflers, etc.

MI, *Magnetic Interference* – Any magnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment.

Microprocessor – A component that incorporates the functions of a computer's central processing unit (CPU) on a single integrated circuit (IC), or at most a few integrated circuits.

Multi-Game – A game which can simultaneously be configured for use with multiple themes and/or multiple paytables.

Multi-Patron Machine – A multi-patron machine is a gaming machine consisting of multiple patron interfaces linked to a shared master console. The master console coordinates game play and supports a consistent game display among the patron interfaces. The patron interfaces contain patron interaction devices and payment devices.

Multi-Wager Game – A game where multiple, independent wagers can simultaneously be applied towards advertised awards.

Mystery Award – A prize paid by a gaming machine that is not associated with a specific payable combination.

Non-Cashable Credits (aka “Restricted Credits”) – Credits that have no cash redemption value.

Non-Cashable Electronic Promotion In – Non-cashable credits electronically transferred to the gaming machine from a patron account.

Near Miss – Showing a top award winning combination above or below an active payline.

Non-EPROM – Any Program Storage Device which is not a physical EPROM.

Non-Wager Purchase – A purchase made by the patron that debits the credit meter and which is used for entertainment purposes only. A non-wager purchase does not influence the outcome of the game. An example might be the purchase of an artistic attribute of a game.

Overflow – Pool containing the contributions which exceed the progressive jackpot or incrementing jackpot ceiling.

PAR Sheet – A specification sheet for a game that provides the theoretical return to patron, hit frequency, symbol combination, number of reels, number of credits that can be accepted, and reel strip listing as applicable.

Parlay Wager – A bet on the outcome of a series of two or more games, matches, or events or on a series of two or more contingencies incident to particular games, matches or events.

Patron Account (aka “Wagering Account”) – An account maintained for a patron where information relative to gaming and financial transactions are recorded on behalf of the patron including, but not limited to, deposits, withdrawals, wagers, winnings, and balance adjustments. The term does not include an account used solely by an operator to track incentive points or credits or similar benefits issued by an operator to a patron which may be redeemed for merchandise and/or services.

Patron Account Transfer In/Out (aka “Wagering Account Transfer”) – Cashable credits electronically transferred to/from the gaming machine from a patron account by means of an external connection between the device and a cashless wagering system.

Patron Credentials – Sensitive information regarding a patron and which may include items such as full name, date of birth, place of birth, , address, phone number, medical or employment history, or other personal information as required by the Commission.

Patron Data – Sensitive information regarding a patron and which may include items such as full name, date of birth, place of birth, social security number, address, phone number, medical or employment history, or other personal information as defined by the regulatory body.

Patron Identification Component – A patron identification component is an electronic device controlled by a machine’s control programme which provides a means for patrons to enter their secure identification information. Examples include a card reader, a barcode reader, or a biometric scanner.

Patron Interaction Device – An internal or external device that connects to a machine and that registers various types of patron inputs allowing the patron to interact with the machine. Several examples include touch screens, button panels, joysticks, handheld controllers, camera systems, etc. The patron interaction device may be hard-wired or wireless. A “smart” patron interaction device supports two-way communications with the gaming machine. For the purpose of this equipment standard, a traditional electromechanical button panel is excluded from this definition unless it is used to affect the outcome for a game.

Payoff Schedule – For a gaming machine, means the list of winning symbols or hands which will result in a win for the patron and the amount won for each combination;

Paytable (aka “Variation”) – The mathematical behavior of a game based upon the data from the manufacturer’s PAR sheet, inclusive of the return percentage, and reflective of all possible payouts/awards.

PCB, Printed Circuit Board – A hardware component of a computer or other electronic device, consisting of a flat piece of a non-conductive, rigid material to which Integrated Circuits (ICs) and other electronic components such as capacitors, resistors, etc. are mounted. Electrical connections are made between the ICs and components using a copper sheet that is laminated into the overall board assembly.

Perfecta (aka “Exacta”) – A wager in which the patron picks the first and second place finishers in a competition in the correct order.

Peripheral – An internal or external device connected to a machine that supports credit acceptance, credit issuance, patron interaction, or other specialized function(s).

Persistence Game – A game that is associated with a unique attribute (e.g., patron ID, game or device ID, etc.) and incorporates a feature that enables progress towards the award of game play enhancements and/or bonuses through the achievement of some designated game outcome.

Physics Engine – Specialized software that approximates the laws of physics, including behaviors such as motion, gravity, speed, acceleration, mass, etc. for a game’s elements or objects. The physics engine is utilized to place game elements/objects into the context of the physical world when rendering computer graphics or video simulations.

PIN, *Personal Identification Number* – A numerical code associated with an individual and which allows secure access to a domain, account, network, system, etc.

Play from Save – A feature utilized in some persistence game designs where complexity increases, or additional elements are added to the game, as play continues. A patron is able to save their progress and resume from the saved point of game play.

Pool – An accumulated reservoir of progressive jackpot or incrementing jackpot monetary contributions.

Prepaid Access Instrument – A card, code, electronic serial number, mobile identification number, personal identification number or similar device used in conjunction with an Interactive Gaming System that allows patron access to funds that have been paid in advance and can be retrieved or transferred at some point in the future through such a device.

Printer – A peripheral that prints wagering instruments, such as tickets, coupons, vouchers, or receipts.

Program Storage Device (*PSD*) – The physical storage media or electronic device that contains control programmes or executable software that operates the gaming machine. Types of PSDs include, but are not limited to, EPROMs, Compact Flash and CFast cards, optical disks, hard drives, solid state drives, and USB drives.

Progressive Jackpot – A monetary award or “payoff” that increases according to the credits wagered in the game.

Promotional Award – An incentive award based on predefined patron activity criteria that are tied to a specific patron account, which generally recur. Examples include earning restricted credits which match their first deposit, awarding points for a certain amount of credits played on a game; awarding credits for wagering more than a certain amount of credits within a specific time period.

Protocol – A set of rules and conventions that specifies information exchange between devices, through a network or other media.

Quinella – A bet in which the first two places in a race must be predicted, but not necessarily in the finishing order.

Rake – The amount or percentage of winnings taken by the casino operator as revenue in poker or other peer-to-peer games.

Regulations – Casino Gaming Regulations made under the Casino Gaming Act.

Residual Credit Removal – A patron-selectable option that allows for the removal of credits left on the machine when there is a credit balance less than that which can be cashed out by the patron using an available, configured payment device. For a gaming machine with a hopper, a residual credit equates to a value less than the dispensed coin or token.

Reset Value – The amount of a progressive jackpot or incrementing jackpot payoff initially offered before it increases.

Restricted Incentive Credits (aka “Non-Cashable Incentive Credits”) – Incentive awards that either have no cash redemption value or cannot be cashed out until a wagering requirement or other restrictions associated with the credits is met.

Restricted Patron Funds – Patron funds that are not redeemable for cash, including restricted incentive credits.

RFI, *Radio Frequency Interference* – Electromagnetic radiation which is emitted by electrical circuits carrying rapidly changing signals, as a by-product of their normal operation, and which causes unwanted signals (interference or noise) to be induced in other circuits.

RNG, *Random Number Generator* – A computational or physical device, algorithm, or system designed to produce numbers in a manner indistinguishable from random selection.

RNG Period – The length of the ordered sequence of raw numbers output by the RNG. When the RNG is cyclic, it has a finite period. Otherwise, the RNG is said to have an infinite period.

RNG State – The state defined by one or more variables in computer memory and represents a specific point within the cycle of the RNG. RNG state may be modified by replacing one or more of these variables with new values, or otherwise mixing the values with new data.

ROM, *Read Only Memory* – The electronic component used for storage of non-volatile information in a gaming machine. The term includes Programmable ROM (PROM) and Erasable Programmable ROM (EPROM).

RTP, *Return to Patrons* – A ratio of the ‘total amount won’ to the ‘total amount wagered’ by a patron. Such a return may be “theoretical” (based on mathematical calculations or simulations) or “actual” (based on the metering supported by a fielded gaming machine).

Rules – Rules made under the Act.

Rules of Play – Those features of a game necessary for a reasonable person to understand how the game is played and such features include, but are not limited to help screens, award cards, and pay-line information, but do not include the inherent features

of a game that a reasonable person should know or understand prior to initiating the game.

Scaling Algorithm – An algorithm or method by which the numbers selected by an RNG are scaled or mapped from a greater range to a lesser range for use in the game.

Scaling Bias – A scaling algorithm is said to have bias if each value in the target range is not selected with equal frequency when mapping all possible values in the original range.

Secure Areas or Secure Compartments – Sensitive areas of a gaming machine such as the logic area, external doors such as the main door or belly door, cash compartments such as a drop box, peripheral device access areas, and other areas for devices that can potentially impact game integrity such as top boxes, controllers, etc.

Seeding / Seed – The initialization of the state variables of an RNG. The source value or values used for initialization is the seed.

Sensitive Information – Includes information such as validation numbers, PINs, patron credentials, passwords, secure seeds and keys, and other data that must be handled in a secure manner.

Server – A running instance of software that is capable of accepting requests from clients, and the computer that executes such software. Servers operate within a Client-Server Architecture, in which “servers” are computer programs running to serve the requests of other programs (“clients”). In this case the “server” would be the Client-Server System and the “clients” would be the Gaming Machine.

Shuffling Algorithm – An algorithm or method by which RNG output is used to produce without replacement data, or, equivalently, to randomize the order of multiple objects. All possible orderings are intended to be equally likely.

Significant Events – Conditions such as power resets, hand pays, door openings/closings, bill validator errors, card reader errors, critical program or memory error, mechanical device errors, and any of the “error conditions” documented within this standard.

SMIB (aka Slot Machine Interface Board) – A circuit board that interfaces the gaming machine with an external system, supporting protocol conversion between the machine and the system.

Software RNG – An RNG that derives its randomness from a computer-based or software-driven algorithm.

Source Code – A text listing of commands to be compiled or assembled into an executable computer program.

Stacker – An electromechanical bill validator component that loads wagering instruments into a locked container for secure storage within the gaming machine.

Startup Value – The initial progressive jackpot or incrementing jackpot value (does not include values from overflow or diversion pools).

State Compromise Extension Attack – A category of attacks in which an attacker compromises a single state of the RNG and penetrates past or future outputs of the RNG using this information. Usually this attack is executed using the seed state or a vulnerable state in which insufficient entropy is available.

Surrender – An option available in some card games where the patron can forfeit half of their wager rather than play out their active hand of cards. There are two types of surrender: early and late. These terms refer to whether or not a dealer checks to see if she/he has a blackjack (when an Ace or 10 is showing) before the patron makes the surrender decision.

Test/Diagnostic Mode (aka “Audit” or “Demo” mode) – A secure mode of a gaming machine that allows a casino employee or casino operator to view game play mechanics, perform payable tests, or execute other auditing and/or diagnostic functions supported by the machine, or that permits secure access to various audit menus that display information related to configuration settings, performance, recall, logs, or accounting and metering information.

Testing Laboratory – means a laboratory contracted by the Commission for the purposes of determining the suitability of gaming equipment.

Ticket and/or Voucher In/Out – The total value of all vouchers accepted or paid out by the device.

Tilt – An error in gaming machine operation that halts or suspends play and/or that generates some intelligent fault message.

Tokenization – When the unit of wager is equal to the denomination of the game, then the tokenization ratio is 1:1. With tokenization, a game with a denomination of one U.S. quarter and a tokenization ratio of 1:5 would provide a patron with five credits per quarter.

Touch Screen – A video display device that also acts as a patron input device by using electrical touch point locations on the display screen.

Tournament – A tournament is an organized, measured event that permits a patron to engage in competitive play against other patrons. An out-of-revenue tournament involves only non-wagered play using tournament credits or points that have no cash value. In contrast, an in-revenue tournament allows for wagered play in conjunction with the operation of the tournament.

Tower Light – A light located on the top of a gaming machine that illuminates automatically in response to various machine error conditions, or which may be illuminated by a patron for summoning a casino employee or other service personnel.

Trifecta – A wager in which a patron wins by selecting the first three finishers of a competition in the correct order of finish.

Unrestricted Incentive Credits (aka “Cashable Incentive Credits”) – Incentive awards that are redeemable for cash.

Unrestricted Patron Funds – Patron funds that are redeemable for cash, including unrestricted incentive credits.

USB, *Universal Serial Bus* – An industry standard interface that defines the cables, connectors and communications protocols used for connection, communication, and power supply between computers and electronic devices. Often used to reference the type of port or a flash type storage device using this interface technology.

Virtual Event Wagering – A form of betting that allows for the placement of wagers on sports, contests, and matches whose results are determined solely by an approved Random Number Generator (RNG).

Virtual Opponent – Term used to describe a computer-based patron that participates in a game with skill and effectively mimics the actions of a live patron.

Virtual Participant – The athlete or other entity that competes in a virtual event.

Voucher – A printed or virtual wagering instrument issued by a gaming machine which can be redeemed for cash or used to subsequently establish credits on a device.

Voucher In/Out (aka “Ticket In/Out”) – The total value of all wagering vouchers accepted or paid out by the kiosk.

Wager – Any commitment of credits or money by the patron which has an impact on game outcome.

Wager Category – A term used to describe different bet options/levels available to the patron in regards to the commitment of credits or money which could have an impact on game outcome.

Wagering Instrument – A printed or virtual representative of value, other than a chip or token and includes coupons and vouchers.